A TEST TO MEASURE THE READING COMPREHENSION OF COMMUNITY COLLEGE STUDENTS USING CONTENT READING MATERIAL FROM THEIR GENERAL EDUCATION CLASSES

By

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Abstract of Dissertation Presented to the Graduate School of the University of Florida in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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The main purpose of this study was to construct and validate the Content Reading Competency Test (CRCT) to measure the ability of community college students to apply skills learned in a developmental reading class to their college textbook material. Another purpose was to test the theoretical model of skills that underlies community college reading instruction in Florida.

Passages were chosen from required textbooks and test items were written to conform to a table of specifications that incorporated the objectives of a developmental reading course. A pilot test administration was done with 130 students. Students' test scores were analyzed and the results were used to revise both forms of the CRCT.

The revised tests were administered to 192 community college students in a pre- and posttest design. Item difficulty levels were computed for all test administrations and used to compute reliability coefficients of internal consistancy. Posttests of the two forms were also correlated.

To establish validity, pretest scores were correlated with students' scores on the Nelson-Denny Reading Test (NDRT) and the American College Test (ACT). They were also compared to posttest scores in a related samples t-test. The posttest scores were also correlated with students' grades.

To test reading comprehension skills underlying Florida community college reading instruction, subscores for the skills reflected in the reading course objectives were computed. A principal components factor analysis showed them to be significantly related.

The results of the hypotheses testing showed (a) a significant relationship between the students' pretest scores and their scores on the Nelson-Denny Reading Test; (b) a significant relationship between the students' pretest scores on the "A" test and their scores on the American College test; (c) a significant difference between the students' pretest and posttest scores; (d) significant relationships between the tests' subscores; (e) no significant relationships between students posttest scores and their grades for college classes; (f) a moderate relationship between the two forms of the test.

CHAPTER I

INTRODUCTION

Background and Justification

The growth of community colleges in America has extended the opportunity for postsecondary education to almost everyone. The "open door" admissions policy offers enrollment to any high school graduate or person over 18 years old who can profit from instruction. Many of these students come to college with inadequate academic preparation, and "remedial," "compensatory," or "developmental" reading improvement courses are now an accepted part of the curriculum (Roueche & Snow, 1977). The objective for all of these courses is the improvement of basic reading skills. It is assumed that meeting this objective will improve student achievement and persistence.

The effectiveness of these reading programs has always been difficult to evaluate because many other factors are involved in student achievement and persistence besides reading. While many programs can demonstrate student gains in reading ability (Sanders, 1979), few do follow-up studies on their students (Roueche & Snow, 1977), and the transfer of reading skills learned in the reading lab or class to reading

materials encountered in regular college classes cannot be assumed (Wilson & Einbecker, 1974).

The need for more direct transfer of reading skills taught in college reading programs to the content reading tasks of the college classroom has led to a search for more generalized learning strategies that are applicable to college reading assignments and to the use of materials actually used in college classes for instruction in reading labs and classes (Hayes & Diehl, 1982). It is assumed that these practices will facilitate transfer of learning, but there is no evaluation methodology except standardized reading tests for measuring the extent of that transfer when the student completes a reading course. While standardized tests correlate well with general college achievement for average and above-average students, they do not adequately reflect the varying nature of the reading task for different kinds of content (Bond & Tinker, 1973; Cooper, 1955). Neither do they demonstrate competency to deal with the students' required textbooks. Difficulty levels and inappropriate norms may also limit their usefulness for assessing the abilities of students in remedial programs (Washington, 1978; Weiner & Zibrin, 1979; Yamagishi & Gillmore, 1980). These studies indicate that better evaluation methods are needed to assess students' abilities to apply their newly learned skills to regular college class reading materials.

Statement of the Problem

The problem investigated in this study was the measurement of community college students' abilities to apply reading skills learned in a developmental reading course to the reading tasks of their required general education courses. To accomplish this, the Content Reading Competency Test (CRCT) was developed and subjected to statistical analysis to estimate its reliability and to establish its validity in terms of content and theoretical constructs of reading skills. To estimate its predictive validity student performance on the CRCT was compared with grades in general education courses for the two following semesters.

Significance of the Study

According to Hankin (1974), teachers estimate that between one in four and one in nine community college students are deficient in basic reading skills. The teachers' estimates are supported by the research of Cline (1972), Hagstrom (1971), Johnston (1980), and Martin (1967), who analyzed student reading achievement scores and the readability levels of their textbooks, and found that most of the books were above the reading level of 50% to 70% of the students.

College reading improvement courses were designed to solve this problem of the mismatch between students and their textbooks. Whether they are called "remedial," "compensatory," "developmental," or "basic," they refer to

educational programs of special or extra services designed to remedy student deficiencies to a level that will permit them to enter regular college courses (Roueche & Kirk, 1972). With its college textbook content base and objective-referenced questions, the CRCT can provide a tool to evaluate individual progress in college-level reading.

Since most poor readers at the college level have mastered primary decoding skills needed to read and understand words and sentences, but not the higher order skills involved in proficient reading comprehension, the state of Florida has adopted a skills-based model of reading comprehension with general objectives that are tested at the end of the sophomore year with the College Level Academic Skills Test (CLAST). These objectives have strongly influenced Florida community college reading course requirements and objectives because passing this test became a state requirement for an Associate of Arts degree in 1984. This study provides an instrument for the assessment of state-mandated reading comprehension skills as they are reflected in community college developmental reading course objectives.

Many types of instructional strategies are used in community college reading programs depending on the philosophy of the instructors and administrators, the needs and abilities of the students, and the availability of materials, equipment, and instructional personnel. Both individual instruction in the diagnostic-prescriptive mode

advocated by Roueche and Snow (1977) and Grant and Hoeber (1978), as well as traditional classroom group instruction can be used to accomplish the objectives, so the skills model provides for some flexibility in program planning. Attempts to validate the skills-based model of reading comprehension have produced conflicting results (Davis, 1972; Siders, 1981; Thurstone, 1946). The results of this study do not support the use of the skills-based model of reading comprehension for community college instruction.

Although college reading programs generally have the support of college faculty and administrators, and their success is highly dependent on it (Eaves, 1973), their major weakness has been the inability to qualify and measure their success (Grant & Hoeber, 1978). Most program evaluations just describe the program and report group gains on standardized reading tests. The adoption of the College Level Academic Skills Test as a graduation requirement has shown that program descriptions and group gains are no longer sufficient. Competency as well as progress must be evaluated to show that college reading programs are fulfilling their original purpose to prepare students for academic success by teaching them to read well enough to understand college textbooks. Most researchers now advocate using more than one criterion measure to evaluate reading programs, controlling as many variables as possible, and tailoring the evaluation procedures to the goals and objectives of the program (Grant & Hoeber, 1978; Johnson, 1981; Maxwell, 1971-72). The

Content Reading Competency Test provides an instrument for measuring student progress and evaluating the transfer of reading lessons learned in a college reading course to the content reading tasks of required college textbooks. It can be used to assist instructors and administrators in making both individual and group-level decisions by adding a new dimension of competency testing to the evaluation of reading programs that is consistent with researchers' recommendations.

Hypotheses

The following hypotheses were tested in this study:

1. There is no relationship between subjects' pretest scores on the Content Reading Competency Test and their scores on the Nelson-Denny Reading Test.

2. There is no relationship between subjects' pretest scores on the Content Reading Competency Test and their scores on the American College Test.

3. There are no significant differences in the subjects' pretest and posttest scores on the Content Reading Competency Test.

4. There is no relationship between the subscores of items on the Content Reading Competency Test which measure different reading comprehension skills.

5. There is no relationship between subjects' posttest scores on the Content Reading Competency Test and their grade point averages for required general education classes taken the following terms.

6. There is no relationship between form "A" and form "B" of the Content Reading Competency Test.

Definition of Terms

For the purpose of this study several terms are defined according to their usage in the study.

Concurrent validity. Evidence of validity gained by correlating test scores with performance at approximately the same time on some external criterion.

Congruent validity. Evidence of validity obtained by correlating scores on a new test with scores on an established test.

Construct validity. Evidence of validity gained by showing the relationship(s) between a theoretical construct and a test that proposes to measure it.

Content classes. College classes that teach subject area material.

Content reading. The process of reading for understanding of information.

Developmental reading course. A college reading course intended to help students develop reading skills.

Distractor. Any incorrect alternative in a multiple choice or matching test item.

General education classes. College subject area classes needed for an Associate of Arts degree.

Instructional objectives. Targets or goals toward which instruction is specifically directed.

Instructional strategy. A systematic teaching plan for achieving a specific objective.

Macrostructure. The topic and general organization of a text passage.

Predictive validity. The extent to which test performance is accurate in predicting some future performance.

Readability. An objective estimate of the comprehensibility of reading material based on selected and quantified variables in the text, especially vocabulary and sentence difficulty. Readability is usually given in terms of reading grade level.

Reading comprehension. The process of getting meaning from printed text.

Reliability. The consistency of a test's measurement, usually expressed as a correlation coefficient describing the extent to which two applications of the same measuring procedure would rank persons in the same way.

Remedial reading course. A college reading course intended to help students improve their reading abilities to the entry levels of programs for which they were previously ineligible.

Standardized test. A test which has a fixed set of items, specific directions for administration and scoring, and established norms.

Table of specifications. A matrix of objectives and content used in test construction to balance the number of items per objective and content area.

Assumptions

1. All students enrolled in the community college developmental reading course received basic reading skills instruction based on their diagnosed needs and the objectives of the course.

2. The Nelson-Denny Reading Test was administered to all students enrolled in the developmental reading course during the first week of classes of the term in which the Content Reading Competency test was validated.

Limitations

1. Relatively short textbook passages were used in the test so that it could be administered in a 50-minute class period. These passages limit the synthesis of meaning for connected discourse to two or three paragraphs and reduce contextual clues for comprehension.

2. The sample population was restricted to community college students enrolled in a developmental reading course. The results of this study can only be generalized to individuals enrolled in similar courses and to the community college reading programs that provide them.

Organization of the Study

The first chapter has identified the problem addressed by the study and stated its purpose. The need for the study was examined and the hypotheses it tested were listed. Terms related to the study were defined and assumptions and limitations related to it were noted.

The second chapter contains a review of the literature which focuses on the relationship between reading ability and college success and the skills-based model of reading comprehension. The third chapter describes the methods used to develop the Content Reading Competency Test, to administer it to a sample population, and to analyze the resulting data. The fourth chapter presents the results of the data analysis. In the fifth chapter conclusions are drawn from the summarized study and recommendations are made. The appendices contain the results of the tests' item analyses, the subjects' scores on the tests, and reproductions of the test materials.

CHAPTER II

REVIEW OF THE LITERATURE

Chapter II reviews the literature in two areas of research related to the topic under investigation. They were (a) the relationship between reading ability and college success, and (b) the skills-based model of reading comprehension.

Reading Ability and College Success

It is a popular belief that there is a strong correlation between reading ability and college success. Researchers have reported "substantial correlations between reading and performance in the other school subjects" (Ebel, 1969, p. 1079) and college aptitude tests are notorious for measuring reading skills as well as content knowledge.

One such aptitude test is the American College Test (ACT) which is administered annually to more than one million college-bound students. It is composed of four content area tests--English, mathematics, science, and social studies--which yield subtest scores and an overall composite score. Wimburn L. Wallace, who reviewed the ACT

for Buros, believed that all of the subtests measure reading, but he still considers it an aptitude test, not a reading test (Buros, 1972).

The ACT is regarded as a good predictor of college success by Wallace. The accuracy of its predictions of college grade point average varies among institutions, but in a typical college, the multiple correlation coefficient is .57 (Your College Freshmen, 1975). Many factors affect the coefficient, including the range of talent, the variability of grades, consistency among instructors, size of the college, ability level of the student body, residential facilities, and pooling of data from different programs. It is quite stable over time, though, and this gives the student and the institution useful information for decision-making (Maxey & Sawyer, 1978).

Other college aptitude tests are also highly correlated with reading ability. Fortna (1963) analyzed a random 10% of 9,000 freshmen tested in the National College Freshmen Testing Program in 1957 and reported high loadings in Verbal Comprehension on the verbal subtest of the School and College Ability Test and on the Sequential Tests of Educational Progress sections on reading comprehension, writing, and social studies (Fortna, 1963).

The most commonly used standardized test for reporting the gains of students enrolled in developmental reading programs is the Nelson-Denny Reading Test. Although it was designed for use with students in grades 9 through 16 and

adults, its content is more appropriate for college students than for high school readers (Buros, 1978). The Nelson-Denny is quick and easy to administer and yields four scores: vocabulary, comprehension, rate, and total. Its ceiling is high, due to the difficulty levels of the items and the short time limits (10 minutes for 100 vocabulary words and 20 minutes for 36 comprehension items). This makes it sensitive to improvement in test-taking strategies as well as reading competency. Both Robert A. Forsyth and Alton L. Raygor, who reviewed it for Buros, questioned its predictive validity for college achievement, especially when it is used to measure the abilities of below-average readers (Buros, 1978).

Test scores are convincing and most college faculty believe that there is a strong correlation between reading ability and college success. On a survey of full-time faculty a Kentucky Wesleyan College reading was rated as "extremely important" for college achievement. Seventy-one percent of the instructors identified reading comprehension as the most essential skill for success in their classes, and 79% rated student reading skills as "poor" or "less than adequate." The chief weaknesses of student readers were thought to be comprehension and critical evaluation of content (Darrell, 1980).

Faculty support has helped college reading programs gain acceptance in the curriculum. In 1977, Roueche and Snow used a survey questionnaire to assess nine areas of

developmental/remedial education in 273 two-year and four-year colleges. They found that 93% of the community colleges and 78% of the senior colleges were providing remedial courses, a 40% increase in four years (Roueche & Snow, 1977).

The nature of college reading programs was studied by Sweiger (1972). She analyzed 288 replies to a survey of community college reading programs in 30 states. She found that most reading courses were designed for freshmen to prepare them for academic work; most programs were developmental, remedial, and corrective; and most had been taught fewer than 10 years. Most were electives under English or humanities, used standardized tests for diagnosis and measurement of achievement, required textbooks, and gave letter grades.

Some studies have found positive effects for college reading improvement courses on academic achievement when the academic courses require a great deal of reading. Rice (1980) found that the difference between students' measured reading ability and the readability of their western civilization textbook was the best predictor of their achievement in that class at Paine College. This procedure was not significant, however, when it was applied to the textbook for biological science.

In another study of student reading ability and textbook readability, Bohuslov (1979) used the Fry Readability Scale to determine the reading levels of textbooks used in

community college English and algebra courses and compared the mean grades of students in the classes with their reading scores on the Gates-MacGintie Reading Test. She found that the students whose scores were no more than one grade level below the text had significantly higher grades in English than the poorer readers. In the algebra classes, which were taught with programmed materials, high attrition prevented a reliable analysis of reading and achievement, but provided a relationship between reading and persistence. In one algebra class 33% of the experimental group finished, compared to 60% of the control group, and in the other algebra class, 10% of the experimental group finished compared to 51% of the control group. Bohuslov recommended that textual materials be tested for readability and the results published for students and faculty, that reading competency levels of students be determined, and that administrators emphasize the importance of matching student reading levels to class materials.

Reinertson (1979) studied "successful" students at a community college in Michigan to establish a minimum-level reading score for college success. She defined "successful" students as those who were enrolled in advanced sophomore classes or in the second semester of a one-year program. She found a great deal of variation in reading skills and no minimal level for success could be established, although only 21% read at a grade level of 10.4 or below, which was the average entry level score. Thirty-two percent of the

"successful" students had taken a reading improvement course, while only 15.45% of entering freshmen in 1978 took it. Since 1978 was a typical semester, she concluded that the reading course had reduced attrition.

Another investigation that found college reading programs to be effective was conducted by Victoria Sanders. She analyzed 28 studies of college reading-study skills programs between 1960 and 1977 that showed mean gains between treatment and control groups on one or a combination of variables and reported that the programs' beneficial effects were statistically significant. The treatment groups surpassed the control groups on four of five tested variables, indicating that students who participated in the reading-study skills programs made greater gains in rate, comprehension, vocabulary, and grade point average (Sanders, 1979). While these gains could be an effect of better programs using better evaluation methods and should be viewed with caution, Sanders' findings are optimistic.

Another well designed study with optimistic results is the 1972 Roueche and Kirk evaluation of four special programs with reading components for high risk students in community colleges. The programs were in different geographical regions, had different structures, served both rural and urban students, and included a substantial number of minority students. The subjects were drawn from stratified random samples based on American College Test scores, race, and academic year of enrollment from the

records of students enrolled in developmental programs over three years. The researchers found that the overall grade point averages of high risk students in these programs was significantly higher (2.66) than high risk students not in remedial programs (1.96), and that 82% of the students in remedial programs completed at least two semesters of college work, compared to only 70% of the high risk controls. From the results of this study, Roueche and Kirk concluded the following:

> High risk students in special programs tend to persist to a greater degree and achieve academically at a higher level than comparable high risk students in regular programs . . . . There is an indication that each year academic performance and persistence rates of high risk students in special programs are increasing. (p. 67)

Other studies have not found such positive results. Grant and Hoeber (1978) analyzed basic skills programs for the American Association for Higher Education and reported that, "(a) those involved and committed to the programs were working very hard, (b) the programs were not working very well, (c) there was a dearth of empirically based evaluation research on the programs" (p. 1). They found the weakest point of the programs to be evaluation, and agreed with Roueche and Snow that the best instructional practices were diagnosis of learning problems and individualized instruction, which they felt should be active, rather than passive.

Kerstiens (1971) reported that only about 28% of the "research studies" done on community college reading instruction in the 1960's investigated or evaluated reading per se. Most were just program descriptions with group gains from pre- and posttest scores on standardized tests reported in grade level equivalents.

Gain scores are easy to compute, impressive, and almost certain to be favorable toward the reading program. But they are unreliable since low scores on pretests tend to rise by chance, even when no changes in learning occur (regression to the mean). They also mask individual differences in achievement. One researcher attempted to demonstrate the folly of depending on pre- and posttest results for evaluation by selecting the students who scored lowest on the pretest, giving them an instructional "treatment" (a 10-minute pep talk on how to score higher on the test), and promptly posttesting them. By showing spurious gains of up to three grade levels, he hoped to reduce the dependence on pre- and posttest gains for program evaluation; but few, if any, reading program personnel heeded his advice (Murphy, 1949). Studies by Bloesser (1968), Lackey & Ross (1968), and Nelson (1962) are typical of the 1960's, reporting stunning gains in pre- and posttest scores as evidence of successful programs. Thompson (1976) reviewed 20 successful programs for high risk students. Only seven of them reported any evaluation other than pre- and posttest score gains.

Still he concluded, "high risk students can improve upon their predicted grade point averages when a study skill/remedial program is employed . . .treatments concentrating on reading and study skills have been most successful" (p.3).

There are several problems associated with using standardized tests to assess the reading ability of community college students. One is the varying difficulty levels of the tests. Weiner and Zibrin (1979) administered five different standardized tests to 118 community college freshmen to assess the interchangeability of tests when grade level cut-off scores were used as pass-fail criteria. They compared students' scores on the California Achievement Test, the Sequential Test of Educational Progress, the Stanford Test of Academic Skills, the Iowa Silent Reading Test, and the College Guidance and Placement Test, and found that nearly one-third of the students at grade levels 11 and 12 were misclassified by one test in terms of another. They concluded that the test outcomes were not equivalent and that grade equivalents are a threat to the criterion related validity of test scores when employed for selection and placement in college. They recommended that institutions use more than one test to measure achievement when grade level equivalent scores are used, and that local validation studies for tests be conducted (Weiner & Zibrin, 1979).

Local validation studies were suggested by Weiner and Zibrin as a solution to the problem of nonequivalent norming populations, which is another problem encountered when standardized tests are normed on high school students and the upper level grade equivalents are extrapolated from that data for use with four-year college students. Neither population is equivalent to community college students in academic ability, background knowledge, attitudes toward learning, or professional expectations. Ahrendt (1975) has described them as a cross-section of the national population that includes terminal students in certificate programs, housewives attending part-time, dropouts who want better jobs, four-year students who fail and want to return, adults taking special interest courses, academic transfers in parallel programs, marginal or high risk students who had trouble finishing high school, and minority students who have taken advantage of the opportunity for a low cost education. Webb (1983) evaluated the three most commonly used standardized tests (Iowa Silent Reading Test; Nelson-Denny Reading Test and Stanford Diagnostic Reading Test, Blue Level) on a 10-point scale that he devised for community college reading programs. Only one, the Iowa Silent Reading Test, had true national norms based on community college populations.

The third factor that causes problems for standardized test users at the community college level is the

varying nature of the reading task. According to Bond and Tinker (1973), the reading abilities essential for achievement in various content subjects differ considerably, and good achievement in one subject area does not necessarily mean good achievement in another. After analyzing student performance in reading various kinds of materials, they report, "Only when the materials in two reading tests are strictly comparable is performance in either comprehension or speed closely related ($r = .85$)" (p. 424).

Other studies on content reading materials have found that correlations between them and general reading materials were lower than those within the subject area vocabulary and reading, and that academic achievement was more highly related to its own measures of reading than to intelligence, silent reading ability, or general vocabulary (Cooper, 1955). After evaluating a reading/study skills summer program to determine whether it could improve underachievers' grades and attrition rates, Bahe (1969) concluded, "Reading ability has more influence on reading test scores than academic success" (p. 57). The practice of evaluating programs solely on the basis of standardized pre- and posttest scores gives little indication of the extent to which the programs have prepared their students to deal effectively with the reading tasks of other college courses they must take. Emmeluth (1980) found that comprehension scores on the

Nelson-Denny Reading Test were significant variables for predicting success in English, business, and mathematics classes at a New York state community college, but even when combined with nine other significant independent variables, they accounted for less than 50% of the variance in final grades.

Most researchers now advocate using more than one criterion measure to evaluate reading programs, controlling as many variables as possible, and tailoring the evaluation procedures to the goals and objectives of the program (Grant & Hoeber, 1978; P. Johnson, 1981; Maxwell, 1971-72). Studies of this type often include grade point averages and attrition as measures of program success since they can be considered as partial accomplishments rather than the total result. Some researchers simply add grade point increases and lowered attrition rates to pre- and posttest gains to report successful programs (Anderson & Freebody, 1979; Bowden, Brown, & Watson, 1970; Collins & Mains, 1960) and unsuccessful programs (Losak, 1968), while others use experimental and quasi-experimental designs to control variables and test results for significance. Freer (1968), Haburton (1976), Smith (1962), and Usova (1979) compared experimental and control groups and found significant differences in grade point averages for students enrolled in reading improvement programs. Two of the four found lower attrition rates and higher posttest

scores for the experimental groups. Haburton's (1976) study showed that the experimental group completed more course hours and withdrew from fewer courses with no significant differences in attrition, but the study did not extend into the following semester.

One possible cause of negative results is that other variables may be more closely related to academic success than reading instruction and confound its effect. Pedrini and Pedrini (1972) analyzed eight factors related to grade point average, including a special program of counseling and classes for disadvantaged students. By using separate regression equations they found the best predictors of grade point average to be persistence/attrition and general achievement/attitude.

Wilson and Einbecker (1974) investigated the relationship between the reading scores of 898 students in four community colleges and their cumulative grade point averages for the first year of college. They used the Reading Index score from the Florida Twelfth Grade Test and found that it was a significant predictor of college grade point average, but it accounted for only 17% to 28% of the variance. They concluded that reading programs assume a transfer of skills, but there is no evidence that they do; and they recommended further research on the relationship of reading improvement in reading courses to achievement.

Feuers (1969) studied reading skills and five other variables in community college curricula. She found no significant relationship between subject grade point averages and comprehension or vocabulary measures, and no relationship between intelligence measures and college or subject grade point averages. She concluded, "It appears that high reading ability gives no assurance of academic success nor, conversely, does low reading ability assure failure in some subject areas" (p. 80).

A study by Spring (1975) even questions the relationship between grade point average and verbal content courses. It shows that there is minimal use of textbooks in most community college classes where the instructor is central and grades had little correlation with reading the textbook.

Emmeluth (1980) also found significant differences between courses for successful students and observed that the success percentage in each course varied with the instructor. It may be that conscientious community college instructors, who have been urged to adapt their course content to the students' abilities and compensate for their reading deficiencies, are doing that in their instructional methods.

Time also seems to be a factor in producing negative results in evaluation studies. Most follow-up studies find that initial gains in experimental groups dissipate as students move through regular college classes. Gaither

(1968) studied 679 students who were divided into an experimental group given basic skills remedial treatment and a control group enrolled in transfer courses. He found at the end of two years that drop-out rates and grades did not differ materially.

The Katz and Wright (1977) study also found that first and second term gains evaporated in the third and fourth semesters, and Bahe (1969) reported that significant individual gains on the posttest made by students in an eight-week summer reading and study skills program were only temporary in all areas except rate. She also found that academic performance of the experimental group was inferior to the control group. Attrition, however, was higher for the controls, and that might have improved their group mean.

Some programs have shown long-term effects. Ray (1967) retested students at three-month and six-month intervals after they completed a reading improvement course and found that significant gains in college reading were retained. There was no control, however, for the effects of maturation, group attrition, or increased reading requirements for college. Freer (1968) also reported that her experimental group retained most gains on reading tests for one year. It may be that the effects of reading instruction as measured by reading tests persist longer than its effects on other measures of

college achievement, such as grade point average and attrition.

From these studies of reading and academic achievement, four conclusions can be drawn: (a) there is a relationship between reading ability and academic achievement; (b) the relationship is not as strong as it is generally believed to be; (c) improved reading skills as measured by test scores do not automatically transfer to college content reading requirements; and (d) other factors are important determinants of academic achievement. One implication of these conclusions is that student reading abilities should be evaluated in terms of their application to the reading requirements of their college courses as well as the requirements of a standardized test.

The Skills-based Model of Reading Comprehension

The skills-based model of reading comprehension is built upon a body of research that uses factor analytic methods to identify skills involved in the reading process and on the traditional subjective lists of skills used in the common practice of teaching reading. One traditional list of reading comprehension skills was published by W. S. Gray in 1919 in the Eighteenth Yearbook of the National Society for the Study of Education. It listed eight skills:

1. To read for the purpose of giving a coherent reproduction;
2. To determine the central thought or the most important idea of a selection;
3. To select a series of closely related points and their supporting details;
4. To secure information which will aid in the solution of a problem or in answering questions;
5. To gain a clear comprehension of the essential conditions of a problem;
6. To discover new problems in regard to a topic;
7. To determine the lines of argument which support the point of view of the author;
8. To determine the validity of statements. (pp. 32-33)

Another well-known subjective analysis of cognitive skills involved in reading comprehension is the Taxonomy of Educational Objectives, compiled by Benjamin S. Bloom and a committee of college and university examiners. This classification of cognitive behaviors includes (a) remembering, (b) reasoning, (c) problem-solving, (d) concept formation, and (e) creative thinking (Bloom, Enelhart, Furst, Hill, & Krathwohl, 1956).

Most of the skills listed by Bloom were identified through factor analysis by Frederick B. Davis in 1944. He reported nine reading comprehension skills:

1. Recalling word meanings;
2. Drawing inferences about the meaning of a word from context;
3. Drawing inferences from content;
4. Ability to select the main thought of a passage;
5. Weaving together ideas in the content;
6. Ability to answer questions that are answered directly in the passage, but not in the words in which the question is asked;
7. Recognizing a writer's purpose, attitude, tone, and mood;

8. Identifying a writer's techniques;
9. Following the structure of a passage.
(p. 663)

Other researchers were unable to verify Davis' work and view reading comprehension as a holistic process of reasoning (Hunt, 1957; Siders, 1981; Thurstone, 1946). In 1968 Davis reanalyzed his data and reduced the number of skills to eight by combining "ability to select the main thought" and "ability to answer questions" into one which he labelled "finding answers to questions answered explicitly or merely in paraphrase" (Davis, 1972, p. 654). He also noted that there was no evidence for a hierarchy of skills and that all of the skills were highly correlated. While each of the eight skills had some unique non-chance variance, 89% of the total variance was accounted for by the "basic mental activities" of verbal reasoning and word knowledge (Davis, 1972).

Other researchers who have contributed to the skills-based model of reading comprehension are Feder (1938), Gans (1940), and Langsam (1941). In 1972 Spearrit used Davis' 1968 data to identify four reading comprehension skills: (a) recalling word meanings; (b) drawing inferences; (c) recognizing the author's purpose, attitude, and mood; and (d) following the structure of a passage. He used maximum likelihood factor analysis and concluded that the last three skills were highly correlated and could be measuring one component (Spearrit, 1972). However, Tuinman (1979) has pointed out, "Once

test constructors included inferential comprehension items in test batteries, it naturally became increasingly impossible by any technique of statistical reduction to show anything but that reading was indeed reasoning" (p. 45).

Dolan, Lunzer, and Waite (1979) used a set of behavioral objectives to construct reading comprehension tests for elementary school children to improve the quality of available tests and to answer the question, "Is reading comprehension unitary or manifold?" (p. 37). The subskills they used to develop their test items were derived from a list of reading comprehension subskills published by the Board of Education for the City of New York:

1. Word meaning;
2. Words in context;
3. Literal comprehension;
4. Drawing inferences from single strings (A string is an uninterrupted sequence of words);
5. Drawing inferences from multiple strings;
6. Finding salients or main ideas;
7. Forming judgments. (p. 44)

While the tests had high reliabilities (.8 to .9) and their validity as compared to a recognized standardized test was good, factor analyses procedures did not support the existence of the identified subskills in elementary students. The researchers concluded, "Individual differences reflect only one general aptitude: this being the pupil's ability and willingness to reflect on whatever

it is he is reading . . . . It is not possible to provide a reliable differential test of comprehension skills" (pp. 64, 70).

Johnson (1981) does not feel that there is any conflict between the skills-based model and the holistic processing theory because the holistic theory views reading as reasoning, and he believes that reasoning can be broken down into constituent skills. He also suggests that skills which may be important at different ages can be obscured in an analysis across different age groups.

The factor structure for different groups taking the same test has been shown to be quite different by Guertin and Bailey (1970). When they divided a group of 200 policemen and firemen applicant scores on the Wechsler Adult Intelligence Test (WAIS) into high and low groups and factor analyzed them separately, the matrix produced by the high group was very different from those of the low group and the total group. In other investigations they have found different factor structures for males and females, and for older and younger siblings.

Since the Davis study was done with college students as subjects and most college reading programs teach comprehension skills as part of a diagnostic-prescriptive and/or traditional class instruction, the state of Florida has adopted the skills-based model for community colleges. The following skills are listed in Florida law:

1. Recognizing main ideas in a given passage;
2. Identifying supporting details;
3. Determining meaning of words on the basis of text;
4. Recognizing stated relationships between words, sentences, and ideas;
5. Recognizing the author's purpose;
6. Distinguishing between statement of fact and statement of opinion;
7. Detecting bias and prejudice;
8. Recognizing author's tone;
9. Perceiving implicit as well as explicit relationships between words, sentences, and ideas;
10. Recognizing valid arguments and drawing logical inferences and conclusions. (Florida Administrative Code, 1982, pp. 331-332)

The College Level Academic Skills Test which is administered to all college sophomores in Florida is based upon these skills in reading, and they have been incorporated into the requirements, objectives, and instruction of community college reading programs throughout the state.

Although the skills-based model of reading comprehension has been widely adopted in practice, empirical tests to validate it have produced conflicting results. Most researchers agree, however, that word knowledge and verbal reasoning are two important components of reading comprehension. Various lists of reading comprehension skills include a number of other skills. While there is little agreement on the nature of these other skills, they all seem to be highly correlated.

The factor analytic studies of reading comprehension have at least two important implications. One is that the factor of "verbal reasoning" which accounts for most of the variance in all or the studies should be investigated. Identification

of the skills involved in it would strengthen the model. A second implication is that if reading comprehension skills are so closely intercorrelated that they cannot be separated by factor analysis, then reading instruction should be concerned with synthesizing the reading process, rather than fragmenting it.

Summary

Research has shown that a substantial number of students entering community colleges under the "open door" admissions policy need to improve their reading abilities to comprehend the textbook materials for their classes. College reading programs have been instituted to meet this need and many studies have shown their beneficial effects in terms of improved scores on standardized reading tests. Demonstrating their positive effects upon academic achievement has been more difficult because reading ability accounts for less than 30% of the variance in grade point average. Other important variables that contribute to academic achievement are the amount of reading required in a course, the readability level of the textbook, the course instructor, the student's attitude, and the amount of time that has elapsed between reading instruction and other courses.

The use of the skills-based model of reading comprehension in community colleges for developmental reading instruction implies that testing be used to determine whether competency needed for college success has been attained.

Since the level of reading proficiency needed for academic success varies with the readability of instructional materials used in the course, direct assessment of reading skills applied to actual content reading materials that the student will be required to use is needed.

CHAPTER III

METHODOLOGY OF THE STUDY

Chapters I and II discussed the need for a valid and reliable reading comprehension test to (a) measure the competency of community college developmental reading students to read the textbook materials used in their general education classes, (b) predict the success of developmental students in general education classes, and (c) provide information for evaluating community college reading programs. The need for further research to investigate the validity of the theoretical model of reading comprehension skills underlying Florida community college reading programs was also examined. The purpose of this study was to construct and validate a reading comprehension competency test that would address these needs. This chapter presents the methodology of the test's development, administration, and analysis. It includes the description of the sample population tested, the procedures for the collection of data, and the procedures used to analyze the data.

Setting of the Study

The study was done at a community college in Florida in the REA 1106 developmental reading classes during the winter and spring terms of 1983. A copy of the course description and requirements for REA 1106 is included in Appendix C.

Description of the Sample

The subjects of the study were all of the students enrolled in the REA 1106 reading classes during the winter and spring terms of 1983. Due to late registration and the inclusion of a small group of evening students, the pretest forms of the Content Reading Competency Test were administered to only 173 of the 192 students enrolled; and because of attrition, only 154 students completed the "A" form post-test, while 139 completed the "B" form. These students were required to take this course during their first term of enrollment at the community college if they failed to pass a screening test for writing and had composite scores on the American College Test between the 8th and 37th percentiles.

Of the 192 students enrolled in REA 1106 in the winter and spring terms of 1983, 92 (48%) were males and 100 (52%) were females. Thirty-five (18%) were Negro, 92 (48%) were Caucasian, 51 (27%) were of Hispanic origin, and 14 (7%) were from other ethnic backgrounds. English was the primary language for 125 (65%) and the secondary language for 67 (35%). One hundred eighty-two of the students were younger

than 30 years of age, while 10 were between 30 and 50, and none were older than 50.

Development of the Test

The test was developed according to the following steps:

1. The researcher met with the community college reading instructors to obtain the instructional objectives to be tested and to determine the importance placed on them in the course's instruction.

2. The researcher met with content area instructors for discussion of the various content reading task requirements and to obtain content outlines and course materials.

3. A table of specifications was constructed using the reading course objectives and the content area materials (see page 40).

4. Passages were selected from the content area textbooks using the following criteria:

   a. Content importance to course.
   b. Relationship to reading skills taught.
   c. Length of passage contains macrostructure, but is not excessive.
   d. Passage meaning is independent of context.
   e. Interest value for college students.

5. Appropriate test items were generated from the passages.

6. Test items were reviewed by reading instructors and content instructors and other reading specialists.

7. Test items were revised as needed.

8. Passages and items were assembled into a testing format of two forms so that all objectives were tested, all content areas were represented, and the test subtotal scores reflected the instructional emphasis of the reading course objectives, with passages and questions arranged on facing pages.

9. Directions were written for the administration of the test.

10. Answer sheets were constructed.

11. Both forms of the test were administered to students in pilot administrations during the summer and fall terms of 1982.

12. Tests were scored and the number of correct items was computed for each student.

13. An item analysis was performed and necessary revisions were made in the test.

To insure content validity, the researcher met with instructors of required general education classes in English, literature, biology, physical science, social science, mathematics, and humanities to determine the nature of the reading tasks in these courses. The instructors were asked to estimate the extent to which general reading ability determines student performance in their classes and the extent to which they use course-required textbooks. Copies of the required textbooks, course outlines, and study guides

were obtained, and their perceptions of students' reading problems related to content reading were solicited.

Eight passages were chosen from the required general education classes' textbooks that represented the content considered important by the content class instructors, reflected the reading course objectives, and had meaning independent of their contexts. Two were from the humanities textbook, two were from natural science textbooks, and one each was from social science, literature, English, and mathematics.

The Fry formula (Forgan & Mangrum, 1976) was used to estimate the readability levels of the passages because of the length restriction and the expository nature of the content material. Readability estimates ranged from 7th to 17th grade levels. They are presented on Table 1, Page 39.

A Table of Specifications (pages 40-41) was constructed using the reading course objectives and the content area materials. Using the selected passages, objective test items were written that test the instructional objectives for the reading course and conform to the Table of Specifications. The number of test items written for each cell was entered on the matrix so that a balanced format was achieved that reflected the importance and instructional emphasis assigned to the objectives by the reading instructors. A minimum of five items tested each objective with 40% of the items measuring objectives classified as literal comprehension skills, 22% measuring vocabulary objectives, 26% measuring

Table 1 Readability Levels of Test Passages

Form "A" Passages	Grade Level
Iodine Test for Starch	9
Panorama and Scene	7
Music in Speech and Drama	15
Order	16

Form "B" Passages	Grade Level
Avoid Awkward or Ambiguous use of a Noun as an Adjective	17
Constants and Variables	12
The Biologically Important Elements	13
The System of Royal Absolutism	14

Table 2 Table of Specifications--Content Reading Competency Test

	Number of Items Used from Each Content Area					
	Hun.	Soc. Sci.	Lit.	Eng.	Nat. Sci.	Math.
I. Literal Comprehension						
1. Follow complex written directions.				5	3	
2. Answer factual questions based on stated information.			1		6	
3. Identify support details.		6				7
4. Identify examples or illustrations.	12		1	3		
II. Inferential Comprehension						
5. Identify the main idea.	4	2	3	1	2	2
6. Draw inferences from passage content.	2	1	3		1	
7. Draw inferences from objects; (graphs, maps, diagrams, & charts)					5	3

III. Evaluative Comprehension							
8. Classify statements as facts or opinions.	6						
9. Draw logical conclusions based on facts in sentences, paragraphs, and longer passages	2	2			3		
IV. Vocabulary							
10. Define words on the basis of sentence narrative in study-type reading using prefixes, roots, suffixes, punctuation, italics, synonyms, antonyms, and analogies	4	2	5	4	5	4	

objectives classified as inferential comprehension, and 12% measuring objectives classified as evaluative comprehension.

All test items were reviewed for content validity by six community college reading instructors, the instructors of the general education classes, and six independent reading specialists. Suggested revisions were made and agreement was reached on the classification of all items on the Table of Specifications.

Pilot Test Administration

After being reviewed for content validity, eight passages and their related test items were assembled into two forms of the Content Reading Competency Test (CRCT). With the exception of the first one, passages were arranged in order of ascending difficulty, as measured by the Fry Readability Formula. They are reproduced in Appendix C. The Tables of Specifications with the item analyses for both forms are presented on pages 43-46. These two forms of the test were administered by community college reading instructors to students enrolled in the developmental reading classes during the winter and summer terms of 1982, with the "A" form as a posttest in the winter term and the "B" form as a posttest in the summer term. Seventy-two students were given the "A" test, and 58 completed the "B" test.

Table 3 Item Analysis of Content Reading Competency Test "A" Form

	Item Analysis					
	Hun.	Soc. Sci.	Lit.	Eng.	Nat. Sci.	Math.
I. Literal Comprehension						
1. Follow complex written directions.					2-4	
2. Answer factual questions based on stated information.			12		5	
3. Identify support details.						41-47
4. Identify examples or illustrations.	23-28		11			
II. Inferential Comprehension						
5. Identify the main idea.	21-22		8-10		1	39-40
6. Draw inferences from passage content.			13-15		7	
7. Draw inferences from objects; (graphs, maps, diagrams, & charts).						48-50

III. Evaluative Comprehension				
8. Classify statements as facts or opinions	31-36			
9. Draw logical conclusions based on facts in sentences, paragraphs, and longer passages.	29-30		6	
IV. Vocabulary				
10. Define words on the basis of sentence narrative in study-type reading using prefixes, roots, suffixes, punctuation, italics, synonyms, antonyms, and analogies.	37-38	16-20		51-54

Table 4 Item Analysis of Content Reading Competency Test "B" Form

	Item Analysis					
	Hun.	Soc. Sci.	Lit.	Eng.	Nat. Sci.	Math.
I. Literal Comprehension						
1. Follow complex written directions.				2-6		
2. Answer factual questions based on stated information.					27-31	
3. Identify support details.		47-52				
4. Identify examples or illustrations.	16-21			7-9		
II. Inferential Comprehension						
5. Identify the main idea.	14-15	44-45		1	26	
6. Draw inferences from passage content.	22-23	46				
7. Draw inferences from objects; (graphs, maps, diagrams, & charts).					32-36	

III. Evaluative Comprehension				
8. Classify statements as facts or opinions				
9. Draw logical conclusions based on facts in sentences, paragraphs, and longer passages.		53-54		37-38
IV. Vocabulary				
10. Define words on the basis of sentence narrative in study-type reading using prefixes, roots, suffixes, punctuation, italics, synonyms, antonyms, and analogies.	24-25	55-56	10-13	39-43

The tests were scored with the number of correct answers comprising the total score. Group means, ranges, and standard deviations were computed, and item analyses were performed on both forms of the test using the biserial correlation of items to total scores procedure to determine levels of difficulty. To identify items needing changes or improvement, tests with scores below 70% were analyzed separately. The number of students who scored below 70% was 34 for the "A" test and 16 for the "B" test. The percent of correct responses for the low-scoring group was then compared to the percent of correct responses for the total group to measure the discrimination value of individual items (Thorndike & Hagen, 1961).

The results of these analyses are presented in Table 5 and listed in detail in Appendix A. Items on the "A" test ranged in difficulty from 18% to 99% correct. Sixty-five percent of these items had acceptable posttest difficulty levels of 44% to 86% correct responses with positive discrimination. On the "B" test, levels of difficulty ranged from 5% to 98% correct. Sixty-eight percent of its items showed acceptable levels of difficulty with positive discrimination.

The group mean for the "A" test with 54 items was 39, and for the "A" test with 56 items, the mean was 40. The range of scores for the "A" test was 26-47, and the standard deviation was 4.6, while the range of scores for the "B" test was 29-50, with a standard deviation of 5.0.

Table 5 Results of First Pilot Test Administration

Form	Number of Subjects	Mean	Range	Standard Deviation	Standard Error of Measurement	Item Difficulty	Reliability Coefficient	Correlation with NDRT
A	72	39	26-27	4.6	2.87	18%-99%	.61	.25*
B	58	40	29-50	5.0	3.04	5%-98%	.63	.53**

*$p < .05$
**$p < .01$

Since test items varied in difficulty, the Kuder-Richardson formula 20 (Brown, 1976) was utilized to compute an estimate of reliability based on the internal consistency of each form of the test. This procedure yielded reliability coefficients of .61 for the "A" form of the CRCT and .63 for the "B" form.

To estimate congruent validity, the scores on both forms of the test were correlated with students' scores on the Nelson-Denny Reading Test (NDRT), which was administered at the beginning of each term. The Pearson product moment "r" for the "A" test and the NDRT was .25; and for the "B" test and the NDRT, it was .53. The correlation coefficient for the "B" form of the CRCT was significant at the $p = .01$ level of confidence and the coefficient of the "A" form was significant at the $p = .05$ level; so this procedure supports the validity of the CRCT as a test of general reading ability (Kurtz & Mayo, 1979).

Pilot Test Workshops

After the administration of each form of the test, the test developer met with the reading instructors who had reviewed and administered it. In these workshop sessions, the test results were examined and guidelines for test items suggested by Bormuth (1970), Gronlund (1967), and Kamil (1979) were applied to the test data.

As a result of these workshops, the following changes were made in the "A" form of the test.

Item 8. The "a" distractor was changed from "The narrator's point of view focuses our attention on whatever the author wishes us to hear and see," to "The narrator's point of view focuses our attention on whatever he wishes us to hear." This was done to weaken it because too many of the better students chose it instead of the correct response which was "B," giving it a negative discrimination value.

Item 14. The item stem was changed from "The tone of the story is," to "The tone of the Galsworthy story is" for clarification.

Item 21. The "A" distractor was weakened by changing it from "Music was used in the theater," to "Music was a part of every theatrical performance."

Item 40. The negative discrimination value of this item seemed to arise from the abstract nature of the correct response, "a." It was changed from "The fact that rational numbers can be ordered in this way is another important property of the set of rational numbers," to "The number line is another important property of the set of rational numbers" to make it incorrect. The "c" distractor was changed to a more concrete statement of the main idea by adding the words "on the number line" at the end, and the test key was changed to make "c" the correct response.

Text 4. In the "Order" passage the symbol for the number "two" in the numerical representation of the statement "Two is greater than negative three" was changed from a minus to a plus to correct a typing error.

As a result of the pilot test workshops, the following changes were made in the "B" form of the test.

Item 1. The stem was changed from "The main idea of the first paragraph is" to "The main idea of the selection is," and the "c" correct response was changed from "Avoid awkward or ambiguous use of a noun form as an adjective" to "Avoid using noun forms as adjectives when they are awkward or confusing." The purpose of these changes was to simplify language and reduce the difficulty level of the item.

Item 9. The stem was changed from "An example of a noun used effectively to modify other nouns is" to "An example of a noun used effectively to modify another noun is." This made the stem agree grammatically with the responses.

Item 14. The words "in some manner" were added to the "d" distractor to make its length comparable to the other responses.

Item 22. The "b" correct response was changed from "the first time people rode on horseback" to "the first explorations of new continents." The purpose of this change was to increase the difficulty level of the item which 95% of all students and 94% of the low-scoring group marked correctly.

Item 23. The "b" distractor was changed from "give examples of constants and variables" to "give examples of the constants and variables that concern artists" and the words "to art" were added to the "c" distractor. The "d" correct response was also changed from "emphasize the importance of

art history as an aid to understanding human nature" to "explain how art is influenced by constants and variables." The purpose of these changes was to clarify the alternatives and reduce the difficulty level of the item.

Item 25. The correct response, "a," was changed from "agreed with" to "made agreement" to make it parallel with the alternatives.

Item 26. The "a" distractor was changed from "Atoms of these six elements can all form bonds with two or more atoms" to "The six elements of life can all form bonds with two or more atoms clarify it and eliminate the pronoun "these" which did not have a referent.

Item 39. The "a" distractor was changed from "soft paper" to "soft flesh" and the "b" distractor from "fine fabric" to "shared electrons" to increase the difficulty level of the item.

Item 42. The correct response, "a," was changed from "combination" to "make-up" to provide a more precise definition.

Item 44. The "b" distractor was changed from "The age of absolutism lasted from 1650 to 1775," to "The age of absolutism lasted from 1650 until 1775 when mercantilism replaced it," and the "c" distractor from "Under the system of absolutism the king was the supreme and only lawgiver," to "Under the system of absolutism, the king was obedient to an extensive bureaucracy." The purpose of these changes was to

reduce the difficulty of the item, which 75% of both groups marked incorrectly.

Item 46. The "d" distractor was changed from "he ordered the courtiers to stop hunting in his state," to "he and the courtiers could hunt anywhere in the state," to make it more plausible.

Item 56. The "d" distractor was changed from "a fawning courtier," to "a ruler elected without opposition," to increase the difficulty level of the item.

Other changes. The order of the third and fourth selections was changed to improve their visual presentation. By printing "The System of Royal Absolutism" before "The Biologically Important Elements" all of the test items for it could be seen without turning the page, and the presentation of "The Biologically Important Elements" was unchanged. The order of the items on the test key was also changed.

Both forms of the original test used in the pilot administration and the revised test are reproduced in Appendix C. Keys for both tests are available from the researcher. The item analysis for the revised form "B" test is presented on pages 55-56.

Collection of the Data

The revised tests were administered by community college reading instructors to all daytime students enrolled in the REA 1106 developmental reading classes at the beginning of the winter and spring terms of 1983 as a pretest, with half

of the classes receiving the "A" form and half receiving the "B" form in order to obtain pretest data on both forms. Differences in the number of students enrolled in the classes, however, resulted in more students receiving the "A" form than the "B" form. The number of subjects for the "A" pretest data is 110, while the number for the "B" pretest data is 63.

The tests were scored and levels of difficulty for individual items were computed as well as group means, ranges, and standard deviations. The pretest scores were correlated with students' scores on the Nelson-Denny Reading Test, and with scores on the American College Test to establish congruent and concurrent validity.

At the ends of the winter and spring terms of 1983, both forms of the test were administered to all students completing the REA 1106 reading course. Those who took the "A" form as a pretest were given the "B" form first, and those who took the "B" form as a pretest were given the "A" form first. This was done to minimize any practice effect from the pretest. These posttests were scored by computer for the number of correct responses on the total test and on the subgroups of items representing four areas of reading comprehension skills, as classified by reading specialists. Individual test items were analyzed for their levels of difficulty and compared with the pretest. Students'

Table 6 Item Analysis of Content Reading Competency Test Revised "B" Form

	Item Analysis					
	Hun.	Soc. Sci.	Lit.	Eng.	Nat. Sci.	Math.
I. Literal Comprehension						
1. Follow complex written directions.				2-6		
2. Answer factual questions based on stated information.					40-44	
3. Identify support details.		29-34				
4. Identify examples or illustrations.	16-21			7-8		
II. Inferential Comprehension						
5. Identify the main idea.	14-15	26-27		1	39	
6. Draw inferences from passage content.	22-23	28				
7. Draw inferences from objects; (graphs, maps, diagrams, & charts).					45-49	

III. Evaluative Comprehension					
8. Classify statements as facts or opinions 9. Draw logical conclusions based on facts in sentences, paragraphs, and longer passages.		35-36		50-51
IV. Vocabulary					
10. Define words on the basis of sentence narrative in study-type reading using prefixes, roots, suffixes, punctuation, italics, synonyms, antonyms, and analogies.	24-25	37-38	10-13	52-56

total test scores on the two forms were also correlated to determine equivalence of forms.

The posttest scores of students who completed general education classes in the summer and fall terms of 1983 were correlated with their grade point averages in the general education classes to estimate the predictive validity of the Content Reading Competency Test.

Treatment of the Data

Validity

Following the administration of the Content Reading Competency Test as a pretest, individual scores were obtained by counting the number of correct items. A Pearson product moment correlation coefficient was computed between students' scores on the test and their scores on a recognized standardized reading test, the Nelson-Denny Reading Test, to establish congruent validity, and to investigate the first hypothesis of this study, there is no relationship between subjects' pretest scores on the Content Reading Competency Test and their scores on the Nelson-Denny Reading Test.

The pretest scores were also correlated with students' scores on a nationally known college placement test, the American College Test, to establish concurrent validity and to test the second hypothesis of the study, there is no relationship between subjects' pretest scores on the Content Reading Competency Test and their scores on the American College Test.

At the ends of the winter, 1983, and the spring, 1983 terms, the CRCT was administered as a posttest using both forms. Tests were scored and individual and group gains computed. The significance of the group gain scores was determined by using a related samples t-test to test the third hypothesis of this study--there are no significant differences in the subjects' pretest and posttest scores on the Content Reading Competency Test.

Subscores based on the item analysis of the four areas of reading comprehension on the Table of Specifications were computed from posttest scores. A principal components factor analysis which computes Pearson product moment correlations among the variables and factors the resulting matrix was performed on the posttest subscores. This was done to test the construct validity of the test's objectives and to investigate this study's fourth hypothesis--there is no relationship between the subscores of items on the Content Reading Competency Test which measure different reading comprehension skills. The 501 program developed by Guertin and Bailey (1970) was used to perform this analysis.

At the end of the fall, 1983 term, students' grade point averages for the required general education classes were computed using a scale of four points for an "A" grade, three points for a "B" grade, two points for a "C" grade, and one point for a "D" grade. These grade point averages were then correlated with their posttest scores on the CRCT and their scores on the American College Test and the Nelson-Denny

Reading Test. This provided an estimate of the test's predictive validity and tested the fifth hypothesis of this study--there is no relationship between subjects' posttest scores on the Content Reading Competency Test and their grade point averages for required general education classes taken the following terms.

Reliability

The means, ranges, and standard deviations for the two forms of the test were computed for both administrations, and both pretest and posttest data were used to compute reliability coefficients of internal consistency, using the Kuder-Richardson 20 formula. This was done to investigate the sixth hypothesis of this study--there is no relationship between form "A" and form "B" of the Content Reading Competency Test. The posttest scores were used to compute a Pearson product moment correlation coefficient to estimate the equivalence of forms. An item analysis was performed using biserial correlation of the items to the totals on both forms of the CRCT for both pretest and posttest administrations. Difficulty levels were obtained for each item from the item analysis and the information was used to provide a basis for revising the items in terms of instructional objectives, equivalency of forms, and standard test item criteria.

Summary

The Content Reading Competency Test (CRCT) was developed by selecting passages from required community college textbooks and constructing test items for them to measure reading comprehension skills taught in a developmental reading course. A pilot administration of the test was done in the winter and summer terms of 1982 at a community college in Florida. Data were analyzed to obtain item difficulty levels and to estimate validity and reliability. This information was used in a workshop with community college instructor to revise and improve the tests.

The revised tests were administered to community college developmental reading classes in the winter and spring terms of 1983. Students' scores on the pretest were correlated with their scores on the Nelson-Denny Reading Test and the American College Test to estimate congruent and concurrent validity. Levels of difficulty were computed for individual items and used to compute coefficients of reliability. Posttest and pretest scores were compared to estimate content validity and posttest scores on the two forms were correlated to test their equivalence. Students' posttest scores were also correlated with their grades in required classes taken in the next two semesters to estimate the tests' predictive validity.

Subscores for the four areas of reading comprehension skills listed in the tests' table of specifications were also

computed and subjected to a principal components factor analysis to test its construct validity.

The data collected by these methods are presented and analyzed in Chapter IV, adhering to the methodology for the treatment of the data described in this chapter.

CHAPTER IV

ANALYSIS OF DATA

The main purpose of this study was to construct and validate a reading comprehension test for community college students that would measure their ability to apply skills learned in a developmental reading course to the reading tasks of required general education courses. A secondary purpose of the study was to test the skills-based model of reading comprehension which underlies this test as well as the state-adopted model for community college reading instruction and the College Level Academic Skills Test.

This chapter presents the analysis of the data in terms of the hypotheses and questions the study addressed. The chapter has seven sections: (a) criteria and use of the CRCT; (b) administration of the CRCT; (c) pretest data analysis; (d) posttest data analysis; (e) predictive validity of the CRCT; (f) reliability of the CRCT; and (g) discussion of the results of the data analysis.

Criteria and Use of the Content Reading Competency Test

The CRCT can best be described as an objectives-based test. According to Popham's 1981 definition, "Objectives-based tests are those whose items have been constructed to measure an instructional objective" (p. 29). Its purpose is to measure the student's achievement of specified objectives in a content area at a given level of proficiency. The objectives used in constructing the CRCT were the instructional objectives of a community college developmental reading course, and the level of proficiency specified was the reading level of required community college textbooks.

When administered as a posttest these criteria combine to make the CRCT appropriate for evaluating student achievement of course objectives to master reading comprehension skills necessary for reading community college text material successfully. As a pretest these criteria make the test useful for evaluating student reading problems.

Administration of the Content Reading Competency Test

The CRCT was administered to students in their reading classes by the community college reading instructors at the beginning and end of the winter and spring terms of 1983. Although the test was untimed, a practical limit of 50 minutes was imposed by giving it during a regular college class period. The test items were scored by hand and

verified by computer, with the total number of items correct constituting the student's total score, and the totals correct on items representing the hypothesized areas of literal, inferential, evaluative, and vocabulary comprehension comprising the subscores. Half of the classes were given the "A" form of the test and half were given the "B" form to minimize the practice effect of the pretest on the posttest. However, since the classes were unequal in enrollment, the number of students pretested with the "A" test was 109, while 62 received the "B" form as a pretest. All students who completed the class were supposed to take both forms of the test at the end of the term as a posttest, with the form they had as a pretest given last. However, due to attrition, absences, and student resistance to testing, 155 completed the "A" form as a posttest, while 139 completed the "B" form.

Pretest Data Analysis

The CRCT was administered as a pretest during the first week of classes in the winter and spring terms of 1983. One hundred nine students were given the "A" form, while 62 received the "B" form. Individual scores and subscores are listed in Appendix B.

A biserial correlation of the correct items to the total scores was performed on both forms of the test to evaluate individual items. It showed that items varied in difficulty

on the "A" form from 9% to 98% correct, and on the "B" form from 26% to 100%. Results of the pretest item analysis are presented in Appendix A and summarized in Table 7, page 66.

Since test items varied in difficulty, the Kuder-Richardson formula 20 was utilized to compute an estimate of reliability based on the internal consistency of each form of the test. This procedure yielded reliability coefficients of .69 for the "A" form of the CRCT and .62 for the "B" form. These data are presented with the means, standard deviations, standard error of measurement, and range of scores in Table 7.

The question of congruent validity of the CRCT is addressed by the null hypothesis:

Hypothesis 1: There is no relationship between subjects' pretest scores on the Content Reading Competency Test and their scores on the Nelson-Denny Reading Test.

New students in the community college developmental reading classes were given the Nelson-Denny Reading Test during the first week of classes of the winter and spring terms of 1983. Students' scores on the NDRT were correlated with the pretest scores on the CRCT to estimate its validity as a general reading achievement test. A Pearson product moment correlation coefficient of .36 was obtained for 103 students who took the "A" form of the

Table 7 Results of the Pretest Administration

Form	Number of Subjects	Mean	Range	Standard Deviation	Standard Error of Measurement	Item Difficulty	Reliability Coefficient	Correlation with NDRT	Correlation with ACT
A	109	38.37	23-48	5.25	2.92	.09-.98	.69	.36*	.38*
B	62	41.17	20-48	4.9	3.02	.26-1.00	.62	.41*	.23

*$p < .01$

pretest and the NDRT. The scores of 56 students who took both the "B" form of the CRCT pretest and the NDRT yielded a Pearson product moment correlation coefficient of .41. Both of these correlation coefficients were significant at the $p = .01$ level; therefore, Hypothesis 1 was rejected. These data are presented in Table 7.

The question of concurrent validity was addressed by the following null hypothesis:

Hypothesis 2: There is no relationship between subjects' pretest scores on the Content Reading Competency Test and their scores on the American College Test.

Incoming students at the community college are required to take the ACT as a condition of entry into an academic degree program. These students' scores on the ACT were correlated with their pretest scores on the CRCT to estimate its validity as a measure of general academic achievement. However, some students enrolled in the REA 1106 reading course were not enrolled in academic programs, and no ACT scores were available for them. This limited the number of subjects for this analysis. A Pearson product moment correlation coefficient of .38 was obtained for 60 students who completed the "A" form of the pretest and the ACT, while the coefficient for 35 students who took the "B" pretest form and the ACT was .23. Although the correlation coefficient for the "A" form was significant at the $p = .01$ level, the coefficient for the "B" form was not significant; therefore,

Hypothesis 2 was rejected for the "A" form of the CRCT, but it was not rejected for the "B" form. These data are presented in Table 7.

While these results failed to show a close relationship between the CRCT and the other two tests, they must be interpreted in light of the differences in the tests and the nature of the population being studied. The CRCT is untimed and entirely based on expository material with the vocabulary questions presented in context. It may not be testing the same skills that the NDRT and the ACT measure. These differences in the tests may also exaggerate the differences in their results with low-ability readers, whose comprehension strategies differ from those of proficient readers (Johnson, 1981).

Posttest Data Analysis

The CRCT was administered as a posttest in the community college developmental reading classes of the 1983 winter and spring terms the week before classes ended. One hundred fifty-five students completed the "A" form and 139 completed the "B" form. Individual scores and subscores are listed in Appendix B.

The percent of students who answered each item correctly was computed for both forms of the posttest to estimate item difficulty levels and to compare the posttest difficulty levels of individual items with their pretest difficulty levels. These analyses showed that items varied in

difficulty on the "A" form from 19% to 99% correct, while the "B" form item difficulty levels ranged from 33% to 99% correct. A comparison of these posttest data to the pretest results of 9% to 98% for the "A" form and 26% to 100% for the "B" form indicates that the posttest was easier than the pretest. Results of the posttest item analyses are presented in Appendix A. They are summarized with the means, standard deviations, standard error of measurements, range of scores, and reliability estimates in Table 8. The validity of the CRCT as a measure of student learning and instructional effectiveness is the concern of the following null hypothesis:

Hypothesis 3: There are no significant differences in the subjects' pretest and posttest scores on the Content Reading Competency Test.

A related samples t-test was used to test this hypothesis. The calculated "t" statistic for 82 students who completed the "A" form of the CRCT as a pretest and posttest was 6.5 with 81 degrees of freedom. The critical value was 2.600 at the .01 level of significance. Therefore, Hypothesis 3 was rejected for the "A" form of the CRCT.

The computed "t" statistic for 38 students who completed the "B" form of the CRCT as a pretest and posttest was 4.4 with 37 degrees of freedom. The critical value was 2.75 at the .01 level of significance. Therefore, Hypothesis 3 was also rejected for the "B" form of the CRCT. These data are presented in Table 8.

Table 8 Results of the Posttest Administration

Form	Number of Subjects	Mean	Range	Standard Deviation	Standard Error of Measurement	Item Difficulty	Reliability Coefficient	Correlation of Forms	Correlation with G.P.A.	Related Samples "t" Test of Pre- and Posttests
Form A	155	42.25	24-50	5.0	2.69	.19-.99	.71	.44*	.18	6.5*
Form B	139	44.43	28-52	4.36	3.02	.33-.99	.61	.44*	.19	4.4*

*$p < .01$

The question of construct validity is also addressed by the null hypothesis:

Hypothesis 4: There is no relationship between the subscores of items on the Content Reading Competency Test which measure different reading comprehension skills.

The subscores for the CRCT were produced by grouping the test items in each of the four areas of reading comprehension on the table of specifications for a separate score. Each student received four subscores representing the number of correct items in the areas of literal, inferential, evaluative, and vocabulary comprehension, as well as a total score of the number of correct items on the whole posttest. These scores are listed in Appendix B.

The subscores for both forms of the posttest were subjected to a principal components factor analysis procedure to test the fourth hypothesis. In both analyses the vocabulary subscore was entered as the first variable, the literal comprehension score as the second variable, the inferential score as the third variable, and the evaluative score as the fourth variable. The 501 computer program developed by Guertin and Bailey (1970) was utilized for both analyses. The number of subjects for the "A" test analysis was 176, and the number for the "B" test was 163.

The 501 principal components factor analysis yields both a matrix of Pearson product moment correlations and a principal axes factor matrix. These data are presented in

Table 9 for the "A" form of the posttest and in Table 10 for the "B" form.

The correlation matrix for the "A" test shows coefficents of correlation between the four variables ranging from .037 to .276, while the "B" form matrix correlations range from .131 to .351. For a group of 152 to 202 subjects correlation coefficients exceeding .159 are significant at the $p = .05$ level of confidence (Kurtz & Mayo, 1979). Therefore, variable one on the "A" form of the posttest, vocabulary comprehension, is significantly correlated with variables two and three, literal and inferential comprehension. Variables two and three are significantly related to each other and to variable four, evaluative comprehension. On the "B" form of the posttest, with 163 subjects, variable one, vocabulary comprehension is significantly correlated with variables three and four, literal and inferential comprehension. Variables three and four are significantly related to each other and to variable two, literal comprehension.

The principal components factor analyses with unities in the diagonals resulted in four-factor principal axes matrices for both forms of the posttest. The latent roots, or sums of the squared column loadings, for the "A" test were 1.78, 0.89, 0.70, and 0.63. For the "B" form of the test the latent roots were 1.61, 0.97, 0.75, and 0.67. All of the variables except the first one, vocabulary comprehension, loaded on the first factor in both analyses. Vocabulary

Table 9 Principal Components Factor Analysis for Form A

Pearson Product Moment Correlations

Variable	1	2	3	4
1. Vocabulary comprehension		.204*	.225**	.037
2. Literal comprehension			.250**	.276**
3. Inferential comprehension				.208**
4. Evaluative comprehension				

*$p < .05$
**$p < .01$

Principal Axes Factor Matrix

Factor	1	2	3	4
1. Vocabulary comprehension	.526	.724	.234	.379
2. Literal comprehension	.720	-.131	.465	-.498
3. Inferential comprehension	.686	.133	-.690	-.189
4. Evaluative comprehension	.589	-.643	.026	.490

Latent Roots (Sum of Squared Column Values)

1.61	.97	.75	.67

Variance accounted for by above matrix = 4.00 which is 100% of total score variance.

Table 10 Principal Components Factor Analysis for Form B

Pearson Product Moment Correlations

Variable	1	2	3	4
1. Vocabulary comprehension		.131	.202*	.254**
2. Literal comprehension			.351**	.306**
3. Inferential comprehension				.289**
4. Evaluative comprehension				

*$p < .05$
**$p < .01$

Principal Axes Factor Matrix

Factor	1	2	3	4
1. Vocabulary comprehension	.534	.785	.217	.229
2. Literal comprehension	.692	-.460	-.022	-.556
3. Inferential comprehension	.714	-.239	.495	-.434
4. Evaluative comprehension	.711	.099	-.639.	- .277

Latent Roots (Sum of Squared Column Values)

1.78	.89	.70	.63

Variance accounted for by above matrix = 4.00 which is 100% of total score variance.

loaded on the second factor with a value of .7845 in the "A" form analysis and .7242 in the "B" form analysis.

The principal components factor analysis procedure shows close relationships between the four hypothesized subscores for both forms of the posttest. The intercorrelation matrices indicate that all of the variables on the "A" form of the test are significantly correlated except vocabulary and evaluative comprehension, and that all of the "B" form variables are significantly correlated except vocabulary and literal comprehension. Although the principal axes matrices for both forms of the posttest did produce four factors, all of the variables except vocabulary registered primary positive loadings on the first factor. Therefore, Hypothesis 4 is rejected for both forms of the CRCT.

Predictive Validity of the Content Reading Competency Test

The predictive validity of the CRCT is addressed by the null hypothesis:

> Hypothesis 5: There is no relationship between subjects' posttest scores on the Content Reading Competency Test and their grade point averages for required general education classes taken the following terms.

Sixty-nine students who completed the "A" form of the CRCT posttest enrolled in required general education classes at the community college during the summer and fall terms of 1983. Their mean G.P.A. for those classes was 1.22.

Correlating their grade point averages in these classes with their CRCT posttest scores resulted in a Pearson product moment correlation coefficient of .18. The resulting coefficient for the 67 students who completed the "B" form of the posttest and were enrolled in 1983 summer and fall term classes was .19. Their mean G.P.A. for those classes was 1.24.

To further test this hypothesis, the CRCT posttest scores were correlated with the students' grades for individual classes. However, only in the English composition class was the number of students enrolled sufficient to report a reliable coefficient. The English composition grades of 46 students who completed the form "A" posttest of the CRCT resulted in a Pearson product moment correlation coefficient of .24, while for 44 students who completed the "B" posttest, the Pearson product moment correlation coefficient with their English composition grades was .26.

Although neither of the coefficients of correlation for the CRCT and students' grade point averages is significant at the $p = .01$ level of confidence and the hypothesis cannot be rejected, they do exhibit internal consistency, and agree with the research of Wilson and Einbecker (1974), who estimated that reading ability accounts for 17% to 28% of the variance in college achievement. They also compare favorably with the Pearson product moment correlation coefficient of .06 for 37 students' grades in the general education classes and their ACT scores, and the coefficient of -.16 for 68

students' grades in the general education classes and their NDRT scores. The Pearson product moment coefficient for English composition grade point averages and the ACT was .02 for 36 students, and for the NDRT scores of 40 students, it was -0.13.

Reliability of the Content Reading Competency Test

The Kuder-Richardson 20 fomula was used to estimate the reliability of the posttest in terms of internal consistency. It yielded a coefficient of .71 for the "A" form of the test and .61 for the "B" form.

An additional test of reliability based on equivalent forms was stated in the null hypothesis:

Hypothesis 6: There is no relationship between form "A" and form "B" of the Content Reading Competency Test.

A Pearson product moment correlation coefficient of .44 was found for the scores of 130 students who completed both forms of the posttest. This was significant at the $p = .01$ level of confidence; therefore, Hypothesis 6 was rejected for the CRCT. However, the coefficient is not sufficient to consider the forms equivalent. These data on reliability are presented on Table 8.

Discussion of the Results of the Data Analysis

The CRCT was developed by using the objectives of a community college developmental reading course and passages

from required college textbooks to frame a table of specifications. Test items based on the reading passages were constructed from the table of specifications and assembled into two forms of the CRCT.

After pilot administrations in the winter and summer terms of 1982, the revised tests were administered to 192 students in the winter and spring terms of 1983. To obtain pretest data on both forms, half of the classes were given the "A" form, and the other half took the "B" form. At the end of the term, all students who completed the reading course took both forms of the CRCT as a posttest. The total number of correct items constitute the student's total score, and the totals correct on items representing the hypothesized areas of literal, inferential, evaluative, and vocabulary comprehension comprise the subscores.

Reliability. Both pretest and posttest data were used to compute reliability coefficients of internal consistency, using the Kuder-Richardson 20 formula. The pretest coefficients were .69 for the "A" test and .62 for the "B" test. The posttest coefficients were .71 for the "A" test and .61 for the "B" test.

To estimate the equivalence of forms, a Pearson product moment correlation coefficient was computed. The resulting coefficient of .44 was sufficient to reject the null hypothesis, but the two forms cannot be considered to be equivalent.

Validity. The pretest scores were correlated with students' scores on the American College Test (ACT) and the Nelson-Denny Reading Test (NDRT) to establish concurrent and congruent validity. The resulting coefficients showed significant relationships between the NDRT and both forms of the CRCT, and between the "A" form of the CRCT and the ACT.

A related samples t-test comparing students' posttest scores with their pretests showed a significant gain at the end of the reading course for both forms of the CRCT.

At the end of the 1983 fall term, students' grade point averages for the required general education classes were computed and correlated with their posttest scores on the CRCT and with their scores on the ACT and the NDRT. While the coefficients for the CRCT were not sufficient to reject the hypothesis of no relationship, they did suggest that the CRCT was a better predictor of success in these classes for these students than either the ACT or the NDRT.

To test the construct validity of the hypothesized subscores based on the traditional groupings of reading comprehension skills as vocabulary, literal, inferential, and evaluative skills, a principal components factor analysis was done. The factor analysis did not support this grouping of skills. Three of the four subscores were significantly correlated on both tests, with different variables uncorrelated in the two different analyses . Both principal components analyses identified vocabulary comprehension as a separate factor, but the other three variables clustered

together on the first factor which seems to represent general reading ability. As a result of these analyses, the fourth hypothesis was rejected for both forms of the CRCT.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter reviews the purpose, procedures, and findings of the study. Conclusions and recommendations are presented at the end of the chapter.

Summary

Purpose

The purpose of this study was to construct and validate a reading comprehension test for community college students that would measure their ability to apply skills learned in a developmental reading course to the reading tasks of required general education courses. To accomplish this, the Content Reading Competency Test (CRCT) was developed and subjected to statistical analysis to estimate its reliability, and to establish its validity in terms of content, prediction, and theoretical constructs of reading skills.

Procedure

The five major procedural steps in this study were (a) development of the CRCT, (b) pilot test administration and revision of the CRCT, (c) administration of the revised CRCT, (d) statistical analysis of the test scores, and (d)

longitudinal comparison of students' general education classes' grades with their test scores.

The CRCT was developed from a table of specifications that incorporated the major reading comprehension objectives of a community college developmental reading course and the content of required college textbooks. After consultation with instructors of required general education classes, passages of appropriate length and interest value were selected from their textbooks. The selected materials had to include important course content with meaning independent of context and be related to the reading skills in the test's objectives. Next, items based on the selected passages were written to test the objectives listed on the table of specifications. They were verified by reading specialists and instructors of the general education classes. At least five items for each objective were included in the table of specifications matrix. The CRCT was then assembled into two forms that reflected the instructional emphasis of the reading course in the four hypothesized areas of reading comprehension: literal (40%), inferential (26%), evaluative (12%), and vocabulary (22%). Passages were evaluated for readability and arranged in order of ascending difficulty, directions were written, and answer sheets were made.

In the summer and fall terms of 1983, both forms of the CRCT were administered as a pilot test to 130 students enrolled in REA 1106 classes. The tests were scored and item

analyses were performed on them. The pilot test results were reviewed in teacher workshops and revisions were made in both forms of the CRCT.

The revised tests were administered to students enrolled in community college developmental reading classes in the winter and spring terms of 1983. In order to obtain pretest data on both forms of the tests, half of the classes were given the "A" form of the test and half took the "B" form. Both forms of the CRCT were administered to the students as posttests at the ends of their developmental reading classes. To minimize any practice effect, the form taken as a pretest was given last.

All of the tests were computer scored for a total of correct items in each reading comprehension skill area, as classified on the table of specifications, and for a total of correct items on the whole test. Item analyses were performed on all of the tests using biserial correlation of the items to the totals, and difficulty levels were obtained for all items.

Data from the item analyses were used to compute reliability coefficients of internal consistency using the Kuder-Richardson 20 formula. To further test the reliability of the CRCT, students' total scores on both forms of the test were correlated to determine whether the two forms were equivalent.

Pretest scores were correlated with students' scores on the Nelson-Denny Reading Test (NDRT) and the American College

Test (ACT) to establish congruent and concurrent validity, respectively. They were also compared to posttest total scores with a related samples t-test to measure students' gains after instruction, and to estimate content validity in terms of the reading course objectives and content.

The posttest was also used to test the construct validity and the predictive validity of the CRCT. Subscores were subjected to a principal components factor analysis procedure to investigate the nature of the hypothesized reading comprehension skills and to test the construct validity of the CRCT in terms of those skills.

For the longitudinal application of the CRCT data, students' grade point averages for general education classes completed in the summer and fall terms of 1983 were computed. These grade point averages were then correlated with CRCT posttest total scores to estimate the predictive validity of the CRCT.

Findings

Pretest scores were correlated with the students' scores on the NDRT, which was also administered at the beginning of the terms, to test the following hypothesis of the study:

> Hypothesis 1. There is no relationship between subjects' pretest scores on the Content Reading Competency Test and their scores on the Nelson-Denny Reading Test.

Hypothesis 1 was tested by computing Pearson product moment correlation coefficients for students' scores on the

NDRT and their pretest scores on both forms of the CRCT. The resulting coefficients of .36 for the "A" form of the CRCT and .41 for the "B" form were significant at the $p = .01$ level, and the hypothesis was rejected.

Pretest scores were also correlated with students' scores on the ACT to test the study's second hypothesis:

> Hypothesis 2. There is no relationship between subjects' pretest scores on the Content Reading Competency Test and their scores on the American College Test.

The Pearson product moment correlation coefficient for pretest scores on the "A" form of the CRCT and students' ACT scores was .38, while the coefficient for the "B" form pretest scores and the ACT scores was .23. The coefficient for the "A" form was significant at the $p = .01$ level but the coefficient for the "B" form was not significant. Therefore, the hypothesis was rejected for the "A" form, but not for the "B" form of the CRCT.

The following hypothesis addressed the validity of the CRCT as a measure of student learning and instructional effectiveness:

> Hypothesis 3. There are no significant differences in subjects' pretest and posttest scores on the Content Reading Competency Test.

This hypothesis was tested with a related samples t-test. The calculated "t" statistic for the "A" form of the

CRCT was 6.5 $>$ .01, with 81 degrees of freedom, and for the "B" form it was 2.75 $>$ .01 with 37 degrees of freedom. Therefore, Hypothesis 3 was rejected for both forms of the test.

Construct validity as a function of the relationship between the CRCT subscores was investigated in this study. The following hypothesis was tested and the findings are summarized:

Hypothesis 4. There is no relationship between the subscores of items on the Content Reading Competency Test which measure different reading comprehension skills.

These analyses, with unities in the diagonals, generated four factors for each form of the CRCT, but in both analyses all of the variables except vocabulary comprehension loaded positively on the first factor. Vocabulary loaded positively on the second factor for both "A" and "B" forms of the test.

Although the principal components analyses separated vocabulary from the other variables, none of these analyses produced four separate factors, and all of them showed close relationships between the four subscores. There, Hypothesis 4 was rejected for both forms of the CRCT.

It was an objective of this study to determine if posttest scores on the CRCT were predictive of success in community college general education classes. The following hypothesis was tested and the findings are summarized:

Hypothesis 5. There is no relationship between subjects' posttest scores on the Content Reading Competency Test and their grade point averages for required general education classes taken the following terms.

A Pearson product moment correlation coefficient was computed for students' posttest scores on both forms of the CRCT and their grade point averages for general education classes completed in the summer and fall terms of 1983. The resulting correlation coefficient for the "A" form of the CRCT was .18, and for the "B" form it was .19. Neither of these coefficients was significant at the $p = .01$ level of confidence and the hypothesis was not rejected.

The CRCT posttest scores were also correlated with students' grades in one class, English composition. The correlation coefficient for the "A" form of the CRCT and English composition grades was .24, and for the "B" form and English composition grades, it was .26.

Students' grade point averages for their general education classes were also correlated with their scores on the NDRT and the ACT. The Pearson product moment correlation coefficient for the ACT and general education classes' grades the coefficient was -.16. Correlation of English composition grades and the ACT and NDRT scores yielded Pearson product moment correlation coefficients of .02 for the ACT and -.13 for the NDRT.

A biserial correlation of the items to total scores was performed to analyze the individual items of each form of the CRCT. Item difficulty levels for the "A" form ranged from .09 to .98 on the pretest administration, and from .19 to .99 on the posttest. For the "B" form, item difficulties were from .26 to 1.00 on the pretest administration, and from .33 to .99 on the posttest. Higher scores on the posttest were reflected in easier item difficulty levels.

To estimate the reliability of the CRCT, coefficients of internal consistency were computed using the Kuder-Richardson 20 formula. The resulting coefficients for the "A" form of the test were .69 for the pretest scores and .71 for the posttest. For the "B" form of the test, coefficients of .62 for the pretest and .61 for the posttest were produced.

The following hypothesis of reliability was also tested in this study:

Hypothesis 6. There is no relationship between form "A" and form "B" of the Content Reading Competency Test.

A Pearson product moment correlation coefficient of .44 was found for the scores of 130 students who completed both forms of the posttest. This was significant at the $p = .01$ level of confidence and the hypothesis was rejected. The coefficient, however, was not sufficient to consider the forms equivalent.

Conclusions

The following conclusions seem warranted in light of the findings and limitations of this study:

1. The "A" and "B" forms of the CRCT are not equivalent, but they are related. The Pearson product moment correlation coefficient of .44 shows a moderate relationship, and the principal components factor analyses produced similar factor structures.

2. The Kuder-Richardson coefficients of internal consistency ranging from .61 to .71 indicate a moderately high level of reliability for the two forms of the CRCT in light of the extremely restricted sample population.

3. The Pearson product moment correlation coefficients computed for the CRCT and students' scores on the NDRT were sufficient to establish validity for the CRCT in relationship to this well-known test.

4. The coefficients computed for the CRCT and students' scores on the ACT established validity for the "A" form of the CRCT in relation to that test, but they did not show a relationship for the "B" form of the CRCT.

5. The Related Samples t-test showed significant gains between pretest and posttest scores, indicating good content validity in terms of sensitivity to instruction in the developmental reading classes.

6. The longitudinal data on students' grades in general education classes taken in the two semesters after their

reading course indicated that the CRCT was a slightly better predictor of success in those classes than the NDRT or the ACT. Although the Pearson product moment correlation coefficients for the CRCT and students' general education classes' grade point averages, which ranged from .18 to .26, were too low to reject the hypothesis of no relationship, they do exhibit internal consistency. They also seem to agree with the research of Einbecker and Wilson (1974), who estimated that reading ability accounts for 17% to 28% of the variance in college achievement.

7. The factor analyses of the four subscores for the CRCT did not support this traditional grouping of skills. All four areas were highly correlated, and the only division indicated was between vocabulary comprehension and the other three factors, which probably represent a knowledge of general reading comprehension strategies when combined this way. These findings agree with Siders (1981), whose meta-analysis of studies of reading comprehension found it to be a unitary process.

8. Vocabulary comprehension separated from the other three variables in the principal components analyses of both forms' subscores. This seems to indicate that knowledge of the vocabulary of a content area is a significant factor in comprehending its text material.

Recommendations

The following recommendations are suggested as a result of the findings and conclusions of this study:

1. The "A" and "B" forms of the CRCT should not be used for pretest and posttest administrations requiring parallel forms since they are not equivalent.

2. Test items which discriminated negatively or failed to discriminate should be revised or discarded.

3. The test should be administered to students with a wider range of ability in order to obtain data from a more heterogeneous population to improve reliability.

4. The "B" form of the test should be correlated with a larger sample of students' scores on the American College Test.

5. Pretest and posttest administrations using the same form of the CRCT can be used to measure students' group gains in knowledge of the content of REA 1106 developmental reading courses, and to measure the effectiveness of instruction.

6. The four hypothesized subscores should not be used as a basis for planning individual instruction in reading comprehension skills.

7. The meanings of vocabulary terms specific to a particular content area should be given renewed instructional emphasis in the content area classes as well as in developmental reading courses.

8. Reading comprehension skills taught in isolation should be incorporated into unified strategies appropriate for different presentations of content area material.

9. Test results for members of minority groups should be studied.

10. The study should be replicated to verify the findings and to find out if they can be generalized to other groups in other institutions.

11. The practice effect on the posttest scores produced by taking the pretest form after the other form should be investigated in another study by administering the form taken as a pretest first.

12. Posttest scores on the CRCT should be used with other tests' results and data for counseling students and scheduling future general education classes.

13. An instructional model for expository material should be developed and tested that is not based on the traditional groupings of reading comprehension skills.

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APPENDIX A

ITEM DIFFICULTY LEVELS OF TESTS

Table 11 Item Difficulty Levels of Pilot Tests

	Percent of Correct Responses for Low-scoring group		Percent of Correct Responses for all subjects	
Item	A	B	Form A	Form B
1	.26	.50	.46	.52
2	.85	.81	.93	.95
3	.91	.75	.97	.79
4	.65	.81	.86	.86
5	.86	.62	.93	.71
6	.09	.94	.18	.86
7	.76	.62	.94	.60
8	.41	.44	.32	.57
9	.68	.88	.79	.88
10	.76	.50	.94	.45
11	.68	.69	.71	.50
12	.24	.75	.47	.90
13	.38	.81	.60	.76
14	.35	.31	.53	.36
15	.59	.38	.78	.34
16	.79	.88	.89	.71
17	.85	.88	.96	.97
18	.74	1.00	.83	.98
19	.68	.69	.75	.73
20	.71	.75	.75	.87
21	.26	.69	.42	.83
22	.32	.95	.44	.95

Table 11--continued

Item	Percent of Correct Responses for Low-scoring group		Percent of Correct Responses for all subjects	
	A	B	Form A	Form B
23	.59	.29	.82	.29
24	.44	.62	.64	.62
25	.53	.69	.75	.57
26	.53	.75	.64	.83
27	.47	.81	.75	.88
28	.44	.69	.58	.76
29	.29	.69	.51	.67
30	.59	.88	.74	.84
31	.68	.62	.82	.71
32	.29	.75	.39	.84
33	.50	.88	.83	.86
34	.50	.94	.67	.95
35	.68	.88	.82	.95
36	.79	.62	.81	.69
37	.79	.38	.96	.50
38	.91	.31	.99	.36
39	.76	.81	.83	.81
40	.38	.69	.21	.65
41	.88	.56	.96	.69
42	.65	.50	.74	.66
43	.26	.81	.49	.81
44	.62	.25	.69	.24

Table 11--continued

Item	Percent of Correct Responses for Low-scoring group		Percent of Correct Responses for all subjects	
	A	B	Form A	Form B
45	.85	.38	.90	.55
46	.59	.75	.78	.67
47	.68	1.00	.74	.91
48	.88	.88	.96	.76
49	.76	.62	.96	.71
50	.68	1.00	.81	.97
51	.65	.75	.69	.74
52	.65	.62	.75	.78
53	.50	.44	.58	.50
54	.91	.44	.99	.40
55	--	1.00	--	.81
56	--	88	--	.90

Table 12 Item Difficulty Levels of Pretests

Item	Percent of Correct Responses	
	Form A	Form B
1	.51	.77
2	.90	.95
3	.94	.79
4	.57	.89
5	.89	.61
6	.27	.89
7	.90	.74
8	.57	.65
9	.78	.90
10	.85	.74
11	.68	.73
12	.41	.90
13	.59	.87
14	.58	.26
15	.73	.45
16	.85	.66
17	.95	.90
18	.85	.94
19	.79	.85
20	.77	.90
21	.38	.82
22	.38	.85

Table 12--continued

Item	Percent of Correct Responses	
	Form A	Form B
23	.83	.40
24	.58	.63
25	.65	.60
26	.60	.63
27	.71	.58
28	.72	.82
29	.42	100.00
30	.74	.79
31	.90	.79
32	.27	.98
33	.82	.71
34	.72	.76
35	.90	.63
36	.85	.37
37	.95	.84
38	.98	.84
39	.76	.70
40	.09	.90
41	.94	.79
42	.72	.61
43	.34	.77
44	.89	.74
45	.94	.84

Table 12--continued

Item	Percent of Correct Responses	
	Form A	Form B
46	.70	.87
47	.78	.87
48	.94	.95
49	.90	.56
50	.83	.47
51	.64	.31
52	.61	.53
53	.65	.69
54	.90	.73
55	--	.61
56	--	.77

Table 13 Item Difficulty Levels of Posttests

Item	Percent of Correct Responses	
	Form A	Form B
1	.61	.73
2	.96	.99
3	.99	.88
4	.72	.91
5	.94	.78
6	.33	.93
7	.94	.81
8	.52	.60
9	.86	.90
10	.86	.75
11	.75	.71
12	.44	.96
13	.65	.88
14	.62	.33
15	.78	.57
16	.92	.76
17	.97	.96
18	.89	.99
19	.89	.88
20	.83	.96
21	.34	.91
22	.50	.87

Table 13--continued

Item	Percent of Correct Responses	
	Form A	Form B
23	.95	.38
24	.68	.71
25	.75	.55
26	.70	.62
27	.77	.72
28	.75	.86
29	.54	.96
30	.77	.91
31	.88	.85
32	.26	.99
33	.83	.82
34	.77	.86
35	.86	.72
36	.85	.55
37	.93	.88
38	.99	.90
39	.84	.83
40	.19	.88
41	.96	.88
42	.81	.69
43	.46	.84
44	.92	.78
45	.97	.87

Table 13--continued

Item	Percent of Correct Responses	
	Form A	Form B
46	.79	.96
47	.83	.96
48	.97	.98
49	.93	.71
50	.86	.63
51	.77	.42
52	.67	.63
53	.68	.82
54	.99	.79
55	--	.62
56	--	.87

APPENDIX B

STUDENTS' SCORES

Table 14 Students' Scores on the Content Reading Competency Test

Subject Number	"A" Pretest	"A" Posttest	"B" Pretest	"B" Posttest	Literal Subscores		Inferential Subscores		Evaluative Subscores		Vocabulary Subscores	
					A	B	A	B	A	B	A	B
400	39	49		43	18	20	13	9	7	3	11	11
401	32	37		40	12	19	10	8	5	3	10	10
402	48	50		47	19	23	14	11	7	3	10	10
403	29	--										
404	40	37		47	13	22	10	11	7	3	7	11
405	39	42		44	15	21	11	9	7	3	9	11
406	39	48		43	17	18	13	10	7	4	11	11
407	40	45		43	19	19	14	9	2	2	10	13
408	44	34		48	11	21	11	10	2	4	10	13
409	38	47		45	17	21	12	12	7	4	11	8
410	38	44			15		11		8		10	
411	42	40		51	16	22	9	12	6	4	9	13
412	39	36		37	15	19	6	8	5	2	10	8
413	33	42			15		13		5		9	
414	39	--										
415	47	46		54	17	25	12	13	6	4	11	12
416	38	50		48	18	24	13	10	8	4	11	10
417	40	--		45		21		9		4		11
418	43	45		46	17	22	11	8	7	4	10	12
419	47	47		42	19	21	11	10	7	3	10	8
420	40	36			13		11		3		9	
421	47	--		52		25		12		4		11
422	39	44		43	16	21	11	9	8	3	9	10
423	37	--		45		20		12		3		10
424	39	--										
425	41	46		51	18	25	11	11	6	4	11	11
426	41	50		50	19	22	13	11	8	4	10	13
427	42	45		47	16	23	12	12	7	4	10	8
428	37	43		43	12	22	12	9	8	3	11	9

Table 14--continued

Subject Number	"A" Pretest	"A" Posttest	"B" Pretest	"B" Posttest	Literal Subscores		Inferential Subscores		Evaluative Subscores		Vocabulary Subscores	
					A	B	A	B	A	B	A	B
429	37	41		47	13	23	9	10	8	2	11	12
430	43	48		44	17	23	13	9	7	3	11	9
431	37	45		41	17	20	12	10	7	4	9	7
432	44	45		46	14	21	12	12	8	4	11	9
433	34	44		43	16	19	12	8	7	3	9	13
434	48	50		53	19	25	12	11	8	4	11	13
435	40	45		48	17	24	11	9	6	4	11	11
436	29	--										
437	38	42		45	15	20	10	10	7	4	10	11
438	41	49		48	19	23	11	11	8	3	11	11
439	40	--										
440	44	--										
441	46	--		47		23		12		3		9
442	41	41		43	18	23	10	8	5	3	8	9
443	41	42		41	17	19	10	10	7	4	8	8
444	48	48		43	18	21	12	10	8	3	10	9
445	35	43		46	13	23	11	9	8	4	11	10
446	36	40		41	15	21	8	9	7	2	10	9
447	47	--										
448	37	43		43	15	20	9	9	8	4	11	10
449	36	40		41	17	19	9	9	6	4	8	9
450	35	--										
451	32	--										
452	37	--										
453	41	--										
454	33	--		41		24		7		2		8
455	34	--										
456	36	38		38	12	17	9	8	8	2	9	11
457	39	--										

Table 14--continued

Subject Number	"A" Pretest	"A" Posttest	"B" Pretest	"B" Posttest	Literal Subscores		Inferential Subscores		Evaluative Subscores		Vocabulary Subscores	
					A	B	A	B	A	B	A	B
458	48	44		47	17	21	12	11	6	4	9	11
459	37	41		44	14	22	11	10	7	4	9	8
460	38	--										
461	41	39		45	17	22	8	10	6	3	8	10
462	41	45		52	17	24	11	14	6	4	11	10
463	44	43		48	17	23	10	8	6	4	10	13
464	45	48		47	17	23	13	11	8	4	10	9
465	42	44		44	17	20	11	13	7	4	9	7
466	30	39		36	17	14	7	9	5	2	10	11
467	39	44		39	14	18	12	10	8	3	10	8
468	30	36		43	13	22	7	10	6	2	10	9
469	46	43		49	15	22	10	11	8	4	10	12
470	43	--										
471	40	--		48		22		11		4		12
472	42	40		40	14	19	11	2	4	3	11	9
473	41	47		43	16	21	13	9	8	4	10	9
474	44	43		48	17	23	10	11	6	3	10	11
475	29	40		42	18	20	6	9	5	4	11	9
476	35	34		28	15	12	10	9	0	3	9	4
477	33	--										
478	23	28		41	13	20	9	10	1	3	5	8
479	36	41			14		11		7		9	
480	33	35		40	16	19	4	11	6	3	9	7
481	38	45		43	17	21	10	9	8	3	10	10
482	39	38		48	13	22	9	12	7	1	9	13
483	35	46		41	17	19	12	9	6	4	11	9
484	30	37		46	15	19	9	11	5	4	8	12
485	37	37		44	11	23	10	9	6	3	10	9
486	33	39		45	11	21	12	11	6	4	10	9

Table 14--continued

Subject Number	"A" Pretest	"A" Posttest	"B" Pretest	"B" Posttest	Literal Subscores		Inferential Subscores		Evaluative Subscores		Vocabulary Subscores	
					A	B	A	B	A	B	A	B
487	31	40		43	17	20	10	9	6	4	7	10
488	40	46		47	16	23	13	11	6	3	11	10
489	34	41		38	16	19	12	11	6	3	7	5
490	41	--										
491	41	40		42	14	21	11	8	4	4	11	9
492	28	--										
493	41	44		47	18	22	10	12	6	3	10	10
494	37	35		42	10	18	10	12	6	2	9	10
495	38	38		43	15	18	11	10	7	4	5	11
496	40	38		50	11	23	12	11	6	4	9	12
497	43	41		42	14	21	11	9	5	3	11	9
498	45	49		53	18	25	13	13	7	3	11	12
499	38	42			17		12		6		7	
500	38	38		51	12	23	10	12	8	4	8	12
501	31	24		36	11	16	4	10	3	3	6	7
502	36	38		48	14	20	9	13	6	4	9	11
503	38	--										
504	38	39		43	13	20	12	7	6	4	8	12
505	38	44		42	18	22	10	9	6	3	10	8
506	26	--		35		17		8		1		9
507	43	44		43	16	22	10	10	7	3	11	8
508	34	--										
509		37	36	48	13	21	10	13	4	2	10	12
510		46	45	--	16		12		8		10	
511		37	34	42	17	20	7	9	3	2	10	11
512		42	39	40	14	18	12	8	6	3	10	11
513		38	42	39	13	15	12	9	4	4	9	11
514		38	45	46	15	21	9	10	6	4	8	11
515		39	40	40	13	16	10	11	5	4	11	9

Table 14--continued

Subject Number	"A" Pretest	"A" Posttest	"B" Pretest	"B" Posttest	Literal Subscores		Inferential Subscores		Evaluative Subscores		Vocabulary Subscores	
					A	B	A	B	A	B	A	B
516		37	46	47	14	20	8	13	6	4	9	10
517		41	42	45	16	20	8	10	6	3	11	12
518		36	39	45	14	23	11	7	2	3	9	12
519		45	47	48	17	22	10	11	8	3	10	12
520		46	40	45	18	22	12	10	6	4	10	9
521		43	35	40	16	18	10	11	7	3	10	8
522		41	41	52	16	24	10	12	5	4	10	12
523		44	40	50	17	23	12	10	6	4	9	13
524		46	46	51	17	23	13	12	8	4	8	12
525			35	--								
526		39	43	43	12	20	12	10	5	3	10	10
527		35	41	--	11		9		6		9	
528		48	45	50	19	23	13	14	6	3	10	10
529			38	--								
530		44	46	42	16	21	12	8	6	4	10	9
531			42	--								
532			47	--								
534		50	46	44	18	22	13	10	8	3	11	9
535		43	44	46	16	21	12	10	6	3	9	12
536			20	--								
537			41	--								
538		45	38	48	17	21	12	13	9	4	7	10
539		43	45	49	18	24	10	9	7	4	8	12
540			31	--								
541		47	45	--	17		12		7		11	
542		41	43	45	16	21	9	11	6	4	10	9
543		43	40	--	16		11		6		10	
544		47	42	--	17		10		9		11	
545		42	45	--	17		11		4		10	

Table 14--continued

Subject Number	"A" Pretest	"A" Posttest	"B" Pretest	"B" Posttest	Literal Subscores		Inferential Subscores		Evaluative Subscores		Vocabulary Subscores	
					A	B	A	B	A	B	A	B
546		31	46	42	11	20	8	10	3	3	9	9
547		37	41	45	14	20	10	11	5	4	8	10
548		32	29	41	10	18	9	9	5	4	8	10
549		42	48	--	13		13		7		9	
550		38	47	44	14	21	6	10	7	3	11	10
551		39	41	38	13	16	11	9	6	3	9	10
552		40	39	48	14	23	10	11	5	4	11	10
553		27	34	35	10	16	6	6	3	4	8	9
554		43	44	--	14		13		5		11	
555			43	--								
556		46	42	--	18		10		7		11	
557		34	37	50	9	25	9	11	7	4	9	10
558		38	44	44	13	20	11	12	6	4	8	8
559		29	41	--	9		8		1		11	
560		37	37	49	11	24	12	10	7	3	7	12
561		41	43	46	16	22	9	8	6	4	10	12
562		35	42	--	12		9		3		11	
563		46	43	--	17		14		6		9	
564		49	42	--	18		13		7		11	
565		32	37	37	9	18	12	8	3	2	8	9
566		45	44	--	16		11		7		11	
567		46	40	--	18		11		7		10	
568		38	43	47	14	22	9	11	7	4	8	10
569			38	--								
570		39	47	49	13	22	11	12	7	3	8	12
571			45	44		22		8		4		10
572		34		33	10	14	9	9	8	2	10	8
573		47		42	18	20	11	9	8	4	10	9
574		38		44	17	21	8	10	4	3	9	10

Table 14--continued

Subject Number	"A" Pretest	"A" Posttest	"B" Pretest	"B" Posttest	Literal Subscores		Inferential Subscores		Evaluative Subscores		Vocabulary Subscores	
					A	B	A	B	A	B	A	B
575		37		35	12	16	9	8	6	3	10	8
576		37			15		7		6		9	
577		44		46	17	21	9	9	8	4	10	12
578		42		44	13	20	11	10	8	4	10	10
579		33		40	15	19	9	9	3	4	6	8
580		46			17		13		7		9	
581		43			13		12		9		9	
582		35		46	11	21	11	11	2	3	11	11
583		43		47	17	23	11	11	6	3	9	10
584		41			15		11		5		10	
585		36		45	13	21	8	9	4	4	11	11
586		33			15		6		6		6	
587		48		44	18	23	10	8	9	3	11	10
588		37		44	13	23	8	9	7	3	9	9
589		43		50	18	24	10	10	5	4	10	12
590				43		22		10		3		8
591		41		45	16	24	9	8	7	4	9	9
592		40		50	16	23	10	11	5	4	9	12

APPENDIX C

TEST MATERIALS

COURSE OUTLINE

REA 1106

Individual Reading I 3 hrs. credit

This course is designed for the student who needs to improve the basic common skills needed in reading all types of materials. A program consisting of individual work, small group and large group activities will be prescribed for each student on the basis of his/her diagnostic reading test.

I Orientation

II Diagnostic Pretest

III Individual and Group Study of Specific Skills

A. Comprehension Skills

1. Following Directions
2. Main Ideas
3. Finding Facts
4. Organizing Ideas
5. Making Inferences

a. Drawing Conclusions
b. Making Judgments

B. Vocabulary Skills

1. Word Structure
2. Words in Isolation
3. Words in Context

IV Application

A. Listening
B. Notetaking
C. Outlining
D. Logical Reasoning
E. Test Taking

V. Posttest

COURSE REQUIREMENTS - REA 1106

The purpose of this course is to develop reading skills which will enable you to succeed in your college courses. It will cover basic skills in the areas of comprehension, and vocabulary. A diagnostic test will be administered during the first week of classes to determine your individual needs in these areas. To build your reading skills, you will be participating in group and individualized lab activities and required textbook assignments. You must pass the final exam to complete the course. You will be evaluated in this course on the following criteria:

(1) Attendance (you must attend at least 90% of the regularly scheduled class periods. This allows no more than 3 absences in 75-minute classes and 4 absences in 50-minute classes.)

(2) Promptness - You are expected to arrive at the beginning of class. If you arrive after the roll is checked, you will be counted tardy. 3 tardies = 1 absence

(3) Periodic progress checks and unit tests (at least 70% competence is expected on each test.)

(4) Completed textbook assignments

(5) The amount of effort which the student puts forth in individual and group activities.

(6) Overall individual progress

(7) Final exam

GRADING POLICY

A - Superior achievement in all aspects of the course

B - Good achievement in all aspects of the course

C - Satisfactory achievement in all aspects of the course

D - Minimum achievement in all aspects of the course

I - Incomplete

W - Competency not achieved - continuation recommended

Pilot Tests

REA 1106 COMPETENCY TEST

Name _____

Section _____

Date _____

Iodine Test for Starch

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Panorama and Scene

8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Music in Speech & Drama

21. _____
22. _____
23. _____
24. _____
25. _____
26. _____
27. _____
28. _____
29. _____
30. _____
31. _____
32. _____
33. _____
34. _____
35. _____
36. _____
37. _____
38. _____

Order

39. _____
40. _____
41. _____
42. _____
43. _____
44. _____
45. _____
46. _____
47. _____
48. _____
49. _____
50. _____
51. _____
52. _____
53. _____
54. _____

REA 1106 COMPETENCY TEST

The competency test has four reading selections from college textbooks, with questions based on each selection. You should be able to complete the test in 50 minutes.

Do not write in the booklet. Mark your answers on the special answer sheet provided by your instructor.

IODINE TEST FOR STARCH

Long chains of glucose molecules in various arrangements make starch molecules. Iodine in the presence of starch turns from brownish-red to deep blue or blue-black. The nature of the colored compound is not perfectly understood.

1. Prepare 3 test tubes, numbering them 1-3.

2. To the test tubes add the following:

   #1 tube -- 2 ml. of cornstarch suspension (about one inch deep)

   #2 tube -- 2 ml. glucose

   #3 tube -- 2 ml. of distilled water

3. To each of the three tubes add one drop of Lugol's iodine solution and shake the tubes gently.

4. Record your results on the data sheet.[1]

I. MAIN IDEA

_____1. The purpose of this lab procedure is to

a. see iodine change color.
b. detect the presence of starch.
c. change glucose into starch.
d. disinfect the test tubes.

II. SUPPORTING DETAILS - Decide whether each detail is true (T), false (F), or not discussed (ND).

_____2. After numbering the test tubes, add 2 ml. of glucose to the #1 tube, 2 ml. of cornstarch suspension to the #2 tube, and 2 ml. of distilled water to the #3 tube.

_____3. Shake each of the tubes gently after adding one drop of Lugol's iodine solution.

_____4. Clean the test tubes before recording the results on the data sheet.

_____5 Iodine mixed with starch turns from deep blue-black to brownish-red.

III. INFERENCES - Choose the best answer.

_____6. When this experiment is done as directed, it will result in

a. three test tubes of a deep blue or blue-black solution.
b. One test tube of a brownish-red solution, one of a deep blue or blue-black solution, and one of a clear solution.
c. two test tubes of a deep blue or blue-black solution and one of brownish-red.
d. two test tubes of a brownish-red solution and one of deep blue or blue-black.

_____7. We can infer that the tubes of blue or blue-black solution

a. will turn to brownish-red.
b. contain distilled water.
c. contain starch
d. were not prepared as directed.

PANORAMA AND SCENE

The narrator's point of view focuses our attention on whatever the author wishes us to hear and see. Joseph Conrad has said, "My task which I am trying to achieve is, by the power of the written word to make you hear, to make you feel--it is, before all, to make you see." To make us see, most writers of fiction use a blend of panorama and scene. Panorama gives us the comprehensive, extensive view, and scene gives us the close-up, or intensive view. Henry James calls them pictorial and picture. The movies use these two views constantly to focus our attention one way or the other.

The panoramic view is usually presented through exposition and description, and it greatly helps to establish the atmosphere and tone of the story. Here are Galsworthy's opening sentences:

> I knew him from the days of my extreme youth, because he made my father's boots; inhabiting with his elder brother two little shops let into one; in a small by-street--now no more, but then most fashionably placed in the West End.
>
> The tenement had a certain quiet distinction; there was no sign upon its face that he made for any of the Royal Family--merely his own German name of Gessler Brothers; and in the window a few pairs of boots... Had he bought them to put there? ...He would never have tolerated in his house leather on which he had not worked himself.

The focus here is comprehensive. The West End of London, the street, the two shops, the window, the shoes, and finally a suggestion of the character of the younger brother. This description of the Gesslers' environment does at least three things almost simultaneously: it describes the Gesslers' character; it establishes the tone of the story--Galsworthy's attitutde toward the facts of the story; and it establishes the authority of the narrator. These three things together help to create the atmosphere which will guide our interpretation of every character and action to follow.[2]

I. MAIN IDEAS - Choose the best answer.

_____8. The main idea of the first paragraph is
   a. The narrator's point of view focuses our attention on whatever the author wishes us to hear and see.
   b. To make us see, most writers of fiction use a blend of panorama and scene.
   c. Henry James calls panorama pictorial, and scene picture.
   d. The movies use these two views constantly to focus our attention one way or the other.

_____9. The main idea of the second paragraph is

a. The panoramic view helps to establish the atmosphere and tone of the story.
b. The focus of Galsworthy's story is comprehensive.
c. This description of the Gesslers' environment does three things.
d. These three things together help to create the atmosphere which will guide our interpretation of every character and action to follow.

_____10. When Joseph Conrad says, "My task which I am trying to achieve is, by the power of the written word to make you hear, to make you feel--it is, before all, to make you see." he means

a. He wants to heal deaf and blind people with written words.
b. Seeing is more important than hearing or feeling.
c. He wants the reader to see in his imagination what is happening in the story.
d. He is a good example of an author who uses panorama and scene.

II. SUPPORTING DETAILS - Choose the best answer.

_____11. The part of Galsworthy's story that is quoted is an example of

a. scene. b. panorama. c. close-up. d. dialogue.

_____12. Our interpretation of character and action after the quoted part of the story is guided by

a. the facts in this section.
b. the atmosphere created in this section.
c. the description of the following scene.
d. the narrator's authority.

III. CRITICAL READING: Making Inferences. Choose the best answer.

_____13. The character of the Gessler Brothers as shown in the store is

a. honest. b. dishonest. c. angry. d. pretentious.

_____14. The tone of the story is

a. humorous. c. admiring.
b. contemptuous. d. bitter.

_____15. We can believe the narrator of the story because

a. he has known the Gessler brothers for a long time.
b. there was no sign that he made boots for the Royal Family.
c. he is older than the Gessler brothers.
d. he would never have tolerated in his house leather on which he had not worked himself.

IV. VOCABULARY: Match the following words with their meanings.

____16. atmosphere
____17. narrator
____18. tone
____19. panorama
____20. scene

a. comprehensive, extensive view
b. the attitude of the writer
c. a story-teller
d. close-up or intensive view
e. a character used as a symbol
f. the environment

MUSIC IN SPEECH AND DRAMA

Music was also a part of every theatrical performance. While the Roman drama omitted the chorus that the Greeks had stressed, its dialogue was interspersed with songs accompanied by the tibia, an ancient wind instrument originally fashioned from the leg bone of an animal. Such musical portions, however, were not composed by the dramatists, as they had been in the Athenian tradition, but were delegated to specialists in this field. The importance of choruses and bands for military morale was not overlooked, and a functional type of military music existed in addition to the trumpet calls to battle. Popular groups played music at games and contests, and strolling street musicians were part of the everyday scene.

The fact that not a single note of any of this music exists today testifies that Roman music was primarily a performing art. While the practicing musicians may very well have composed their own songs and pieces or made variations on traditional tunes, none seem to have been concerned with writing them down--and if they had done so, the later Church fathers would very likely have had these pagan melodies committed to the flames. So, like the folk music that existed only in oral tradition until the coming of modern notation and recording devices, the art of Roman music died with the people who practiced it.[3]

I. MAIN IDEA - Choose the best answer.

____21. The main idea of the first paragraph is that

a. Music was used in the theaters.
b. Romans used music differently from the Greeks.
c. Music was an important part of life in Rome.
d. Strolling street musicians were a part of the everyday scene.

____22. The main idea of the second paragraph is that

a. There is no Roman music in existence today.
b. Roman music was a performing art.
c. The later Church fathers burned all of the Roman music.
d. Roman composers did not write down their music.

II. SUPPORTING DETAILS - Classify the following uses of music as ROMAN or GREEK.

____23. A chorus was used in the drama.

____24. Choruses and bands were used for military morale.

____25. The trumpet was used for battle calls.

____26. The dramatists composed the music.

____27. Popular groups played music at games and contests.

____28. Music was composed by musical specialists.

III. CRITICAL READING: Drawing Conclusions. Choose the best answer.

____29. For musicians, the fact that no Roman music exists today is

a. good.
b. bad.
c. unimportant.
d. artistic.

____30. If a piece of real Roman music were found, it would be

a. new.
b. military.
c. valuable.
d. worthless.

IV. CRITICAL READING: Fact vs. Opinion. Decide whether the following statements are FACT or OPINION.

____31. Not a single note of any of this music exists today.

____32. Roman music was primarily a performing art.

____33. Practicing musicians may very well have composed their own songs.

____34. The later Church fathers would very likely have had these pagan melodies committed to the flames.

____35. The folk music existed only in oral tradition, until the coming of modern notation and recording devices.

____36. The art of Roman music died with the people who practiced it.

V. VOCABULARY - Choose the best answer.

____37. The tibia was

a. an animal.
b. a chorus.
c. a music specialist.
d. a musical instrument.

____38. In the second paragraph, "testifies" means

a. sings softly.
b. gives evidence.
c. tells lies.
d. makes up stories.

ORDER

A very useful model for illustrating the set of rational numbers is a number line, partially represented in Fig. 1.2. A point of central position, called the ORIGIN, is identified on the line, and the number 0 is associated with it. By convention, the positive integers in increasing sequence to the right, and the negative integers in decreasing sequence to the left, are associated with points spaced at equal intervals in both directions from the origin. Rational numbers that are not integers are associated with points appropriately spaced between those associated with the integers.

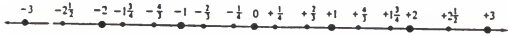

Fig. 1.2

The fact that the rational numbers can be ordered in this way is another important property of the set. Each rational number, when compared with any other rational number, is either greater than or less than that number. In terms of the number line, it can be said that each number is GREATER THAN (symbolically,) every number located to its left, and LESS THAN (symbolically,) every number located to its right.[4] As can be verified from Fig. 1.2:

$+3 > +1, \quad +1 < +2, \quad -2\ 1/2 < 0, \quad -2 > -3, \quad -1/4 > -1$

I. MAIN IDEA - Choose the best answer.

____39. The main idea of the first paragraph is

a. A number line can be used to illustrate the order of the set of rational numbers.
b. A point of central position, called the origin, is identified on the line.
c. Positive integers are to the right of zero, and negative integers are to the left.
d. Rational numbers that are not integers are associated with points appropriately spaced between the integers.

____40. The main idea of the second paragraph is

a. The fact that rational numbers can be ordered in this way is another important property of the set.

b. Each rational number, when compared with any other rational number, is either greater than or less than that number.

c. Each number is greater than every number located to its left and less than every number located to its right on the number line.

d. The symbol for <u>greater than</u> is , and the symbol for <u>less than</u> is .

II. SUPPORTING DETAILS - Decide whether each detail is true (T), false (F) or not discussed (ND).

____41. The number zero is in the center of the number line.

____42. A number to the left of another number is less than that number.

____43. Negative numbers are the opposites of positive numbers.

____44. Plus two is greater than minus three.

____45. The symbol for <u>greater than</u> is .

____46. A number to the right of another number is greater than that number.

____47. Minus one-fourth is greater than minus one.

III. INFERENCES - Choose the best answer.

____48. Positive numbers are

a. greater than negative numbers.
b. less than negative numbers.
c. less than zero.
d. to the left of negative numbers.

____49. Plus one is

a. greater than minus one.
b. less than minus one.
c. equal to minus one.
d. less than zero.

____50. The number zero is

a. positive.
b. negative.
c. neither positive nor negative.
d. equal.

IV VOCABULARY - Use the reading selection to choose the definition that best fits each word.

____51. origin (paragraph 1)

a. convention of placing positive integers to the right of zero
b. the number zero in the center of the number line
c. beginning point on a number line
d. a model for illustrating the set of rational numbers

____52. integer (paragraph 1)

a. whole number
b. fraction
c. mixed number
d. improper fraction

____53. sequence paragraph 1)

a. equal intervals
b. order
c. appropriate space
d. convention

____54. verified (paragraph 2)

a. ordered
b. proved
c. spaced
d. changed

Notes

[1]From General Biology Laboratory Manual (2d ed.) (p. 30) by P. C. Drummond, A. B. Feldherr, W. F. Greenhood, A. S. Guertin, M. J. Hanson, R. Johnson, E. C. Odum, L. Prescott, M. Vyverberg, and H. L. Wheeler, 1980, Raleigh, N. C.: Contemporary Publishing Company. Copyright 1980, 1978 by Contemporary Publishing Company of Raleight. Reprinted by permission.

[2]From Interpreting Literature, (shorter ed.) (p. 18) by K. L. Knickerbocker and H. W. Reninger, 1979, New York: Holt, Rhinehart and Winston. Copyright 1979 by Holt, Rhinehart and Winston. Reprinted by permission.

[3]From Arts & Ideas (6th ed.) (p. 90) by W. Fleming, 1980, New York: Holt, Rhinehart and Winston. Copyright 1980, 1974, 1963, 1955 by Holt, Rhinehart and Winston. Reprinted by permission.

[4]From Elements of Algebra (2nd ed.) (pp. 12-13) by F. J. Mueller, 1975, Englewood Cliffs, N. J.: Prentice-Hall, Inc. Copyright 1975 by Prentice-Hall, Inc. Reprinted by permission.

REA 1106 COMPETENCY TEST

Name _____

Section _____

Date _____

Avoid Awkward or Ambiguous Use of a Noun Form as an Adjective

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____

Constants and Variables

15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____

The Biologically Important Elements

26. _____
27. _____
28. _____
29. _____
30. _____
31. _____
32. _____
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34. _____
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36. _____
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42. _____
43. _____

The System of Royal Absolutism

44. _____
45. _____
46. _____
47. _____
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49. _____
50. _____
51. _____
52. _____
53. _____
54. _____
55. _____
56. _____

REA 1106 COMPETENCY TEST

Form B

The competency test has four reading selections from college textbooks with questions based on each selection. You should be able to complete the test in 50 minutes.

READING SELECTION NO. 1 - English

AVOID AWKWARD OR AMBIGUOUS USE OF A NOUN FORM AS AN ADJECTIVE.

Many noun forms are used effectively to modify other nouns (as in boat race, show business, college student and so on), especially when appropriate adjectives are not available. But such forms should be avoided when they are either awkward or confusing.

AWKWARD Many candidates entered the president race.

BETTER Many candidates entered the presidential race.

CONFUSING The Representative Landor recess maneuvers led to victory.

BETTER Representative Landor's maneuvers during the recess led to victory.

Exercise 4: Correct all errors in the use of adjectives or adverbs. Also eliminate any awkward use of nouns as adjectives. Put a checkmark after any sentence that needs no revision.

1. The repair estimates mechanic was out to lunch.

2. She was even more livelier than her daughter.

3. The class enjoyed writing autobiography compositions.

4. The magazine has been published continuous since 1951, but it does not sell good now.

5. Baseball is more easy followed than football.

6. The older of the two is doing well in school.

7. Maribeth lives in a reasonable exclusive Kansas City resident area.

8. That food, I thought, can't taste as bad as it looks.

9. That is the worse grade I have ever received.

10. The recession and inflation kept getting worser.[1]

QUESTIONS FOR READING SELECTION NO. 1

I. MAIN IDEA - Choose the best answer.

_____1. The main idea of the selection is

a. Nouns should not be used as adjectives.
b. Many noun forms are used effectively to modify other nouns
c. Avoid using noun forms as adjectives when they are awkward or confusing.
d. Use nouns when appropriate adjectives are not available.

II. SUPPORTING DETAILS - Decide whether each of the following is a true (T) statement of the directions for Excercise 4, a false (F) statement of those directions, or is not discussed (ND).

_____2. Eliminate any awkward use of nouns as adjectives.

_____3. Put a checkmark after any sentence that needs to be revised.

_____4. Correct all errors in the use of adverbs.

_____5. Underline noun forms used effectively to modify other nouns.

_____6. Correct all errors in the use of adjectives.

III. CRITICAL READING: Finding examples. Choose the best answer.

_____7. Which of the following sentences in Exercise 4 is NOT done according to directions?

a. The repair estimates mechanic was out to lunch.

b. The recession and inflation kept getting ~~worse~~ worser

c. Baseball is more ~~easy~~ easily followed than football.

d. The older of the two is doing well in school.

_____8. The awkward noun form in the third sentence of Exercise 4 is:

a. class. b. writing.
c. autobiography. d. compositions.

_____9. An example of a noun used effectively to modify another noun is

a. president race. b. law aid.
c. enjoy food d. college student.

IV. VOCABULARY Match each word with its correct meaning. Write the letter for your answer choice in the space provided.

____10. awkward
____11. confusing
____12. eliminate
____13. revision

a. change
b. appropriate
c. clumsy
d. ambiguous
e. take out

READING SELECTION NO. 2 - Humanities

CONSTANTS AND VARIABLES

Artists, like scientists, are concerned with both constants and variables. Over thousands of years human nature has remained relatively constant. Like the ancients, we marvel at the fertility of life, the miracle of birth, the process of growth and maturity, the experience of joy and sorrow, the mystery of death. Like the people of antiquity, we are attracted by sights and sounds that delight the eye and ear; we wonder at the change of seasons, the awesomeness of the seven seas, and the vast expanse of starry skies. Like the ancient Greeks, we still try to come to terms with our own inner nature, to adjust to society and become part of the social scene, and to speculate on our place in the universal scheme of things. And like the peoples of the past, we still try to express these continually recurring themes in our poetry, music, art, and literature.

If human nature is a constant, human invention is a bedazzling variable. In the past few decades, we have seen the arrival of jet transportation, the development of atomic energy, the computerization of information, and the beginning of satellite communications and space exploration. It is doubtful, however, that the thrill of supersonic air speed is any greater than when the ancients first rode on horseback, when the Industrial Revolution produced the iron horse, when gunpowder was first invented, or when new continents were first explored in the age of discovery. Electronics and photojournalism have brought the whole world before our eyes. We can now watch astronauts walking on the surface of the moon and computer-controlled shovels scooping up soil samples on Mars. Yet people have always communicated--another constant--and the development of speech, language, writing, and the printed word are equal causes for wonderment. The ever-shrinking horizons have reduced our world to a planetary community. The process has also contracted our sense of time so that knowledge about the arts of the past has molded the present into an extended historical now.[2]

QUESTIONS FOR READING SELECTION NO. 2

I. MAIN IDEAS - Choose the best answer.

____14. The central theme of this selection is

a. Human nature is a constant and human intervention is a variable.
b. Artists are concerned with both constants and variables.
c. We express the same themes in art that the ancient Greeks used.
d. People have always communicated in some manner.

____15. The conclusion of the second paragraph is

a. Modern inventions have made the world seem smaller and the past seem closer.
b. Human nature is a constant and human invention is a variable.
c. Jet transportation, atomic energy, computerized information, satellite communications, and space exploration are modern inventions.
d. The development of speech, language, writing, and the printed word were just as important as modern inventions.

II. SUPPORTING DETAILS

Classify the following details. Write "C" for each constant and "V" for each variable.

____16. Communication between people.

____17. The miracle of birth.

____18. The development of atomic energy.

____19. Coming to terms with our own inner nature.

____20. Astronauts walking on the surface of the moon.

____21. The change of the seasons.

III. CRITICAL READING: THE WRITER'S CRAFT. Choose the best answer.

____22. The thrill of supersonic air speed is compared to

a. the development of speech, language, writing and the printed word.
b. the first explorations of new continents.
c. computer-controlled shovels scooping up soil on Mars.
d. astronauts walking on the surface of the moon.

____23. The author's purpose is to

a. demonstate how times have changed since the days of the ancient Greeks.
b. give examples of the constants and variables that concern artists.
c. show the importance of modern inventions to art.
d. explain how art is influenced by constants and variables.

IV. VOCABULARY - Choose the best answer.

____24. The meaning of photojournalism in the second paragraph is

a. the use of copy machines to publish newspapers.
b. the use of computers to transmit news.
c. the reporting of news with pictures.
d. the use of pictures taken from satellites.

____25. The meaning of contracted in the second paragraph is

a. made agreement.
b. made larger.
c. made longer.
e. made smaller.

READING SELECTION NO. 3 - Biology

THE BIOLOGICALLY IMPORTANT ELEMENTS

Of the 92 naturally occurring elements, only six make up some 99% of all living tissue (See Table 1-4). These six elements are carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur, conveniently remembered as CHNOPS. These are not the most abundant of the elements of the earth's surface. Why, as life assembled and evolved from stardust, were these of such importance? One clue is that the atoms of all of these elements need to gain electrons to complete their outer energy levels. Thus they generally form covalent bonds. Because these atoms are small, the shared electrons in the bonds are held closely to the nuclei, producing very stable molecules. Moreover, with the exception of hydrogen, atoms of these elements can all form bonds with two or more atoms, giving rise to the complex molecules necessary for life.[3]

Table 1-4 Atomic composition of three representative organisms

Element	Human	Alfalfa	Bacterium
Carbon	19.37%	11.34%	12.14%
Hydrogen	9.31	8.72	9.94
Nitrogen	5.14	0.83	3.04
Oxygen	62.81	77.90	73.68
Phosphorus	0.63	0.71	0.60
Sulfur	0.64	0.10	0.32
CHNOPS total:	97.90%	99.60%	99.72%

QUESTIONS FOR READING SELECTION NO. 3

I. MAIN IDEA - Choose the best answer.

____26. The main idea of this paragraph is

a. The six elements of life can all form bonds with two or more atoms.
b. CHNOPS stands for carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur.
c. Six elements make up 99% of all living tissue.
d. There are 92 naturally occurring elements.

II. SUPPORTING DETAILS
The following statements are given as reasons for the six elements being important to life. Use the reading selection to decide whether they are true (T), false (F) or not discussed (ND).

____27. The six elements form covalent bonds.

____28. All but hydrogen can bond with two or more atoms.

____29. Other elements are more abundant on the earth's surface.

____30. A carbon atom has four electrons in its outer energy level.

____31. The six elements form very stable molecules.

III. CRITICAL READING: Drawing Inferences from a chart.
Use the Table 1-4 to help you complete the following statements.

____32. The _____body is composed of the same elements that make up alfalfa and bacterium.

____33. The organism with the highest percentage of oxygen is _____.

____34. The organism with the highest percentage of carbon is _____.

____35. The element that makes up the smallest percentage of alfalfa and bacterium is _____.

____36. The element with the most similar percentages in all three organisms is_____.

IV. CRITICAL READING: Drawing Conclusions. Choose the best answer.

____37. Hydrogen atoms can bond with

a. only one atom of other elements.
b. two or more atoms of other elements.
c. the nuclei of other elements.
d. complex molecules of other elements.

____38. The author believes that

a. life was created.
b. life evolved from other matter.
c. life depends on complex, unstable molecules.
d. life is an abundant element of the earth's surface.

V. VOCABULARY

Use the reading selection to choose the definition that best fits each word.

____39. tissue

a. soft flesh
b. shared electrons
c. cell structure
d. human beings

____40. nuclei

a. nerves
b. cells
c. edges
d. centers

____41. bonds

a. investments
b. secure connections
c. elements
d. extra orbits

____42. composition

a. make-up
b. written work
c. agreement
d. artistic form

____43. organism

a. element
b. physical response
c. operation
d. living thing

READING SELECTION NO. 3 - Social Science

THE SYSTEM OF ROYAL ABSOLUTISM

Aspiration of absolutism. In the period from 1650 to 1775 the royal architects of the national state system reached the height of their power. During this age of absolutism the king was in theory an autocrat responsible to God alone. The outstanding example of the absolute monarch was Louis XIV of France, who is said to have once exclaimed to his fawning courtiers, "L'etate, c'est moi" ("I am the state").

Under the system of absolutism the king aspired--although aspirations were often far different than realities--to exercise a tight control over his subjects. He was the supreme and only lawgiver. As head of the church he decided what religion his subjects were to follow and persecuted those who dissented. The worship of God was a matter of state, not of individual conscience. In accordance with mercantilist practice, the king sought to regulate every phase of economic life, from the establishment of new industries to working conditions and standards of quality. In addition, he was the arbiter of manners and fashion, the patron of arts and letters, and the personification of national glory. His will was enforced by an obedient and extensive bureaucracy--although far from the kind of administrative machinery that states today have at their disposal.

The aspirations of absolute monarchs were widely supported, for a powerful king stood for order, efficiency, security, and prosperity--values willingly exchanged for the uncertainties of upheaval and bloodshed such as had been experienced during the turmoil of the preceding era of religious wars.[4]

QUESTIONS FOR READING SELECTION NO.4

I. MAIN IDEAS - Choose the best answer.

____44. The central theme of this passage is

a. From 1650 to 1775 the royal architects of the national state system reached the height of their power.
b. The age of absolutism lasted from 1650 until 1775 when mercantilism replaced it.
c. Under the system of absolutism the king was obedient to an extensive bureaucracy.
d. From 1650 to 1775 kings aspired to be absolute monarchs who exercised tight control over their subjects.

____45. The main idea of the third paragraph is

a. There had been a great deal of turmoil in the preceding era of religious wars.
b. People supported strong kings because they wanted order, efficiency, security, and prosperity.
c. Absolute monarchs were supported because they stood for upheaval and bloodshed.
d. People were willing to change their values during the era of religious wars.

____46. When Louis XIV said, "I am the state," he meant that

a. he alone ruled France.
b. he was an outstanding example of a French person.
c. he owned all of France.
d. he and the courtiers could hunt anywhere in the state.

II. SUPPORTING DETAILS
Write "T" if the following powers and roles were assumed by an absolute monarch, "F" if they were not, or "ND" if they were not discussed.

____47. He was the head of the church and decided what religion his subjects would follow.

____48. He was the patron of arts and letters.

____49. He was the head of scientific research.

____50. He was the supreme and only lawgiver.

____51. He was the commander of the army and navy, and conducted foreign policy.

____52. He regulated the working conditions and standards of quality in industry.

III. DRAWING CONCLUSIONS - Choose the best answer.

____53. We may infer from this selection that people of this period

a. were happy under the rule of absolute monarchs.
b. were willing to give up a great deal of freedom to have peace and prosperity.
c. were allowed a great deal of religious freedom.
d. had to pay high taxes to support the absolute monarchs.

____54. One reason for the rise of absolute monarchs was

a. People did not know which religion was best for them.
b. An extensive bureaucracy was set up to enforce their laws.
c. The outstanding example set by Louis XIV of France.
d. People had suffured in an era of religious wars before 1650.

IV. VOCABULARY - Choose the best answer.

____55. In the second paragraph, dissented means

a. agreed. b. disagreed. c. went away. d. stayed.

____56. In the first paragraph, an autocrat is

a. a person who collects cars.
b. a royal architect.
c. a person who rules alone.
d. a ruler elected without opposition.

Notes

[1]From Harbrace College Handbook (9th ed.) (pp. 54-55) by J. C. Hodges and M. E. Whitten, 1982, New York: Harcourt Brace Jovanovich, Inc. Copyright 1982, 1977, 1972, 1967, 1962, 1956, 1951, 1946, 1941 by Harcourt Brace Jovanovich, Inc. Reprinted by permission.

[2]From Arts & Ideas (6th ed.) (p. 4) by W. Fleming, 1980, New York: Holt, Rhinehart and Winston. Copyright 1980, 1974, 1963, 1955 by Holt, Rhinehart and Winston. Reprinted by permission.

[3]From Invitation to Biology (3rd ed.) (p. 23) by N. S. Barnes and H. Curtis, 1981, New York: Worth Publishers. Copyright 1981, 1977, 1972 by Worth Publishers, Inc. Reprinted by permission.

[4]From Civilization Past and Present (5th ed.) (p. 442) by N. M. Bailkey, G. F. Jewsbury, A. M. Taylor, and T. W. Wallbank, 1978, Glenview, ILL.: Scott, Foresman and Company. Copyright 1978, 1975, 1971, 1967, 1962 by Scott Foresman and Company. Reprinted by permission.

Revised Tests

REA 1106 COMPETENCY TEST

Name _____

Section _____

Date _____

Iodine Test for Starch

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Panorama and Scene

8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Music in Speech & Drama

21. _____
22. _____
23. _____
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Order

39. _____
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46. _____
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49. _____
50. _____
51. _____
52. _____
53. _____
54. _____

REA 1106 COMPETENCY TEST

Form A

The competency test has four reading selections from college textbooks, with questions based on each selection. You should be able to complete the test in 50 minutes.

Do not write in the booklet. Mark your answers on the special answer sheet provided by your instructor.

IODINE TEST FOR STARCH

Long chains of glucose molecules in various arrangements make starch molecules. Iodine in the presence of starch turns from brownish-red to deep blue or blue-black. The nature of the colored compound is not perfectly understood.

1. Prepare 3 test tubes, numbering them 1-3.

2. To the test tubes add the following:

   #1 tube -- 2 ml. of cornstarch suspension (about one inch deep)

   #2 tube -- 2 ml. glucose

   #3 tube -- 2 ml. of distilled water

3. To each of the three tubes add one drop of Lugol's iodine solution and shake the tubes gently.

4. Record your results on the data sheet.[1]

I. MAIN IDEA

_____1. The purpose of this lab procedure is to

a. see iodine change color.
b. detect the presence of starch.
c. change glucose into starch.
d. disinfect the test tubes.

II. SUPPORTING DETAILS Decide whether each detail is true (T), false (F), or not discussed (ND).

_____2. After numbering the test tubes, add 2 ml. of glucose to the #1 tube, 2 ml. of cornstarch suspension to the #2 tube, and 2 ml. of distilled water to the #3 tube.

_____3. Shake each of the tubes gently after adding one drop of Lugol's iodine solution.

_____4. Clean the test tubes before recording the results on the data sheet.

_____5 Iodine mixed with starch turns from deep blue-black to brownish-red.

III. INFERENCES - Choose the best answer.

_____6. When this experiment is done as directed, it will result in

a. three test tubes of a deep blue or blue-black solution.
b. One test tube of a brownish-red solution, one of a deep blue or blue-black solution, and one of a clear solution.
c. two test tubes of a deep blue or blue-black solution and one of brownish-red.
d. two test tubes of a brownish-red solution and one of deep blue or blue-black.

_____7. We can infer that the tubes of blue or blue-black solution

a. will turn to brownish-red.
b. contain distilled water.
c. contain starch
d. were not prepared as directed.

PANORAMA AND SCENE

The narrator's point of view focuses our attention on whatever the author wishes us to hear and see. Joseph Conrad has said, "My task which I am trying to achieve is, by the power of the written word to make you hear, to make you feel--it is, before all, to make you see." To make us see, most writers of fiction use a blend of panorama and scene. Panorama gives us the comprehensive, extensive view, and scene gives us the close-up, or intensive view. Henry James calls them pictorial and picture. The movies use these two views constantly to focus our attention one way or the other.

The panoramic view is usually presented through exposition and description, and it greatly helps to establish the atmosphere and tone of the story. Here are Galsworthy's opening sentences:

> I knew him from the days of my extreme youth, because he made my father's boots; inhabiting with his elder brother two little shops let into one; in a small by-street--now no more, but then most fashionably placed in the West End.
>
> The tenement had a certain quiet distinction; there was no sign upon its face that he made for any of the Royal Family--merely his own German name of Gessler Brothers; and in the window a few pairs of boots... Had he bought them to put there? ...He would never have tolerated in his house leather on which he had not worked himself.

The focus here is comprehensive. The West End of London, the street, the two shops, the window, the shoes, and finally a suggestion of the character of the younger brother. This description of the Gesslers' environment does at least three things almost simultaneously: it describes the Gesslers' character; it establishes the tone of the story--Galsworthy's attitutde toward the facts of the story; and it establishes the authority of the narrator. These three things together help to create the atmosphere which will guide our interpretation of every character and action to follow.[2]

I. MAIN IDEAS - Choose the best answer.

_____8. The main idea of the first paragraph is
   a. The narrator's point of view focuses our attention on whatever the author wishes us to hear and see.
   b. To make us see, most writers of fiction use a blend of panorama and scene.
   c. Henry James calls panorama pictorial, and scene picture.
   d. The movies use these two views constantly to focus our attention one way or the other.

_____9. The main idea of the second paragraph is

a. The panoramic view helps to establish the atmosphere and tone of the story.
b. The focus of Galsworthy's story is comprehensive.
c. This description of the Gesslers' environment does three things.
d. These three things together help to create the atmosphere which will guide our interpretation of every character and action to follow.

_____10. When Joseph Conrad says, "My task which I am trying to achieve is, by the power of the written word to make you hear, to make you feel--it is, before all, to make you see." he means

a. He wants to heal deaf and blind people with written words.
b. Seeing is more important than hearing or feeling.
c. He wants the reader to see in his imagination what is happening in the story.
d. He is a good example of an author who uses panorama and scene.

II. SUPPORTING DETAILS - Choose the best answer.

_____11. The part of Galsworthy's story that is quoted is an example of

a. scene. b. panorama. c. close-up. d. dialogue.

_____12. Our interpretation of character and action after the quoted part of the story is guided by

a. the facts in this section.
b. the atmosphere created in this section.
c. the description of the following scene.
d. the narrator's authority.

III. CRITICAL READING: Making Inferences - Choose the best answer.

_____13. The character of the Gessler Brothers as shown in the store is

a. honest. b. dishonest. c. angry. d. pretentious.

_____14. The tone of the Galsworthy story is

a. humorous. c. admiring.
b. contemptuous. d. bitter.

_____15. We can believe the narrator of the story because

a. he has known the Gessler brothers for a long time.
b. there was no sign that he made boots for the Royal Family.
c. he is older than the Gessler brothers.
d. he would never have tolerated in his house leather on which he had not worked himself.

IV. VOCABULARY: Match the following words with their meanings.

____16. atmosphere
____17. narrator
____18. tone
____19. panorama
____20. scene

a. comprehensive, extensive view
b. the attitude of the writer
c. a story-teller
d. close-up or intensive view
e. a character used as a symbol
f. the environment

MUSIC IN SPEECH AND DRAMA

Music was also a part of every theatrical performance. While the Roman drama omitted the chorus that the Greeks had stressed, its dialogue was interspersed with songs accompanied by the tibia, an ancient wind instrument originally fashioned from the leg bone of an animal. Such musical portions, however, were not composed by the dramatists, as they had been in the Athenian tradition, but were delegated to specialists in this field. The importance of choruses and bands for military morale was not overlooked, and a functional type of military music existed in addition to the trumpet calls to battle. Popular groups played music at games and contests, and strolling street musicians were part of the everyday scene.

The fact that not a single note of any of this music exists today testifies that Roman music was primarily a performing art. While the practicing musicians may very well have composed their own songs and pieces or made variations on traditional tunes, none seem to have been concerned with writing them down--and if they had done so, the later Church fathers would very likely have had these pagan melodies committed to the flames. So, like the folk music that existed only in oral tradition until the coming of modern notation and recording devices, the art of Roman music died with the people who practiced it.[3]

I. MAIN IDEA - Choose the best answer.

____21. The main idea of the first paragraph is that

a. Music was a part of every theatrical performance.
b. Romans used music differently from the Greeks.
c. Music was an important part of life in Rome.
d. Strolling street musicians were a part of the everyday scene.

____22. The main idea of the second paragraph is that

a. There is no Roman music in existence today.
b. Roman music was a performing art.
c. The later Church fathers burned all of the Roman music.
d. Roman composers did not write down their music.

II. SUPPORTING DETAILS Classify the following uses of music as ROMAN or GREEK.

____23. A chorus was used in the drama.

____24. Choruses and bands were used for military morale.

____25. The trumpet was used for battle calls.

____26. The dramatists composed the music.

____27. Popular groups played music at games and contests.

____28. Music was composed by musical specialists.

III. CRITICAL READING: Drawing Conclusions
Choose the best answer.

____29. For musicians, the fact that no Roman music exists today is

a. good.
b. bad.
c. unimportant.
d. artistic.

____30. If a piece of real Roman music were found, it would be

a. new.
b. military.
c. valuable.
d. worthless.

IV. CRITICAL READING: Fact vs. Opinion
Decide whether the following statements are FACT or OPINION.

____31. Not a single note of any of this music exists today.

____32. Roman music was primarily a performing art.

____33. Practicing musicians may very well have composed their own songs.

____34. The later Church fathers would very likely have had these pagan melodies committed to the flames.

____35. The folk music existed only in oral tradition, until the coming of modern notation and recording devices.

____36. The art of Roman music died with the people who practiced it.

V. VOCABULARY - Choose the best answer.

____37. The tibia was

a. an animal.
b. a chorus.
c. a music specialist.
d. a musical instrument.

____38. In the second paragraph, "testifies" means

a. sings softly.
b. gives evidence.
c. tells lies.
d. makes up stories.

ORDER

A very useful model for illustrating the set of rational numbers is a number line, partially represented in Fig. 1.2. A point of central position, called the ORIGIN, is identified on the line, and the number 0 is associated with it. By convention, the positive integers in increasing sequence to the right, and the negative integers in decreasing sequence to the left, are associated with points spaced at equal intervals in both directions from the origin. Rational numbers that are not integers are associated with points appropriately spaced between those associated with the integers.

Fig. 1.2

The fact that the rational numbers can be ordered in this way is another important property of the set. Each rational number, when compared with any other rational number, is either greater than or less than that number. In terms of the number line, it can be said that each number is GREATER THAN (symbolically,) every number located to its left, and LESS THAN (symbolically,) every number located to its right.[4] As can be verified from Fig. 1.2:

+3 ⊳ +1, +1⊲ +2, -2 1/2⊲ 0, +2 -3, -1/4 ⊳-1

I. MAIN IDEA - Choose the best answer.

____39. The main idea of the first paragraph is

a. A number line can be used to illustrate the order of the set of rational numbers.
b. A point of central position, called the origin, is identified on the line.
c. Positive integers are to the right of zero, and negative integers are to the left.
d. Rational numbers that are not integers are associated with points appropriately spaced between the integers.

____40. The main idea of the second paragraph is

a. A number line is another important property of the set of rational numbers.

b. Each rational number, when compared with any other rational number, is either greater than or less than that number.

c. Each number is greater than every number located to its left and less than every number located to its right on the number line.

d. The symbol for <u>greater than</u> is , and the symbol for <u>less than</u> is .

II. SUPPORTING DETAILS Decide whether each detail is true (T), false (F) or not discussed (ND).

____41. The number zero is in the center of the number line.

____42. A number to the left of another number is less than that number.

____43. Negative numbers are the opposites of positive numbers.

____44. Plus two is greater than minus three.

____45. The symbol for <u>greater than is</u> .

____46. A number to the right of another number is greater than that number.

____47. Minus one-fourth is greater than minus one.

III. INFERENCES - Choose the best answer.

____48. Positive numbers are

a. greater than negative numbers.
b. less than negative numbers.
c. less than zero.
d. to the left of negative numbers.

____49. Plus one is

a. greater than minus one.
b. less than minus one.
c. equal to minus one.
d. less than zero.

____50. The number zero is

a. positive.
b. negative.
c. neither positive nor negative.
d. equal.

IV VOCABULARY

Use the reading selection to choose the definition that best fits each word.

____51. origin (paragraph 1)

a. convention of placing positive integers to the right of zero
b. the number zero in the center of the number line
c. beginning point on a number line
d. a model for illustrating the set of rational numbers

____52. integer (paragraph 1)

a. whole number
b. fraction
c. mixed number
d. improper fraction

____53. sequence paragraph 1)

a. equal intervals
b. order
c. appropriate space
d. convention

____54. verified (paragraph 2)

a. ordered
b. proved
c. spaced
d. changed

Notes

[1]From General Biology Laboratory Manual (2d ed.) (p. 30) by P. C. Drummond, A. B. Feldherr, W. F. Greenhood, A. S. Guertin, M. J. Hanson, R. Johnson, E. C. Odum, L. Prescott, M. Vyverberg, and H. L. Wheeler, 1980, Raleigh, N. C.: Contemporary Publishing Company. Copyright 1980, 1978 by Contemporary Publishing Company of Raleight. Reprinted by permission.

[2]From Interpreting Literature, (shorter ed.) (p. 18) by K. L. Knickerbocker and H. W. Reninger, 1979, New York: Holt, Rhinehart and Winston. Copyright 1979 by Holt, Rhinehart and Winston. Reprinted by permission.

[3]From Arts & Ideas (6th ed.) (p. 90) by W. Fleming, 1980, New York: Holt, Rhinehart and Winston. Copyright 1980, 1974, 1963, 1955 by Holt, Rhinehart and Winston. Reprinted by permission.

[4]From Elements of Algebra (2nd ed.) (pp. 12-13) by F. J. Mueller, 1975, Englewood Cliffs, N. J.: Prentice-Hall, Inc. Copyright 1975 by Prentice-Hall, Inc. Reprinted by permission.

REA 1106 COMPETENCY TEST

Name _____

Section _____

Date _____

Avoid Awkward or Ambiguous Use of a Noun Form as an Adjective

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____

Constants and Variables

15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____

The Biologically Important Elements

26. _____
27. _____
28. _____
29. _____
30. _____
31. _____
32. _____
33. _____
34. _____
35. _____
36. _____
37. _____
38. _____
39. _____
40. _____
41. _____
42. _____
43. _____

The System of Royal Absolutism

44. _____
45. _____
46. _____
47. _____
48. _____
49. _____
50. _____
51. _____
52. _____
53. _____
54. _____
55. _____
56. _____

REA 1106 COMPETENCY TEST

Form B

The competency test has four reading selections from college textbooks with questions based on each selection. You should be able to complete the test in 50 minutes.

READING SELECTION NO. 1 - English

AVOID AWKWARD OR AMBIGUOUS USE OF A NOUN FORM AS AN ADJECTIVE.

Many noun forms are used effectively to modify other nouns (as in boat race, show business, college student and so on), especially when appropriate adjectives are not available. But such forms should be avoided when they are either awkward or confusing.

AWKWARD Many candidates entered the president race.

BETTER Many candidates entered the presidential race.

CONFUSING The Representative Landor recess maneuvers led to victory.

BETTER Representative Landor's maneuvers during the recess led to victory.

Exercise 4: Correct all errors in the use of adjectives or adverbs. Also eliminate any awkward use of nouns as adjectives. Put a checkmark after any sentence that needs no revision.[1]

1. The repair estimates mechanic was out to lunch.

2. She was even more livelier than her daughter.

3. The class enjoyed writing autobiography compositions.

4. The magazine has been published continuous since 1951, but it does not sell good now.

5. Baseball is more easy followed than football.

6. The older of the two is doing well in school.

7. Maribeth lives in a reasonable exclusive Kansas City resident area.

8. That food, I thought, can't taste as bad as it looks.

9. That is the worse grade I have ever received.

10. The recession and inflation kept getting worser.

QUESTIONS FOR READING SELECTION NO. 1

I. MAIN IDEA - Choose the best answer.

_____1. The main idea of the selection is

a. Nouns should not be used as adjectives.
b. Many noun forms are used effectively to modify other nouns
c. Avoid using noun forms as adjectives when they are awkward or confusing.
d. Use nouns when appropriate adjectives are not available.

II. SUPPORTING DETAILS

Decide whether each of the following is a true (T) statement of the directions for Excercise 4, a false (F) statement of those directions, or is not discusses (ND).

_____2. Eliminate any awkward use of nouns as adjectives.

_____3. Put a checkmark after any sentence that needs to be revised.

_____4. Correct all erros in the use of adverbs.

_____5. Underline noun forms used effectively to modify other nouns.

_____6. Correct all errors in the use of adjectives.

III. CRITICAL READING: Finding examples. Choose the best answer.

_____7. Which of the following sentences in Exercise 4 is NOT done according to directions?

a. The repair estimates mechanic was out to lunch.

b. The recession and inflation kept getting ~~worse~~ worser

c. Baseball is more ~~easy~~ easily followed than football.

d. The older of the two is doing well in school.

_____8. The awkward noun form in the third sentence of Exercise 4 is:

a. class.
b. writing.
c. autobiography
d. compositions.

_____9. An example of a noun used effectively to modify another noun is

a. president race.
b. law aid.
c. enjoy food.
d. college student.

IV. VOCABULARY

Match each word with its correct meaning. Write the letter for your answer choice in the space provided.

____10. awkward
____11. confusing
____12. eliminate
____13. revision

a. change
b. appropriate
c. clumsy
d. ambiguous
e. take out

READING SELECTION NO. 2 - Humanities

CONSTANTS AND VARIABLES

Artists, like scientists, are concerned with both constants and variables. Over thousands of years human nature has remained relatively constant. Like the ancients, we marvel at the fertility of life, the miracle of birth, the process of growth and maturity, the experience of joy and sorrow, the mystery of death. Like the people of antiquity, we are attracted by sights and sounds that delight the eye and ear; we wonder at the change of seasons, the awesomeness of the seven seas, and the vast expanse of starry skies. Like the ancient Greeks, we still try to come to terms with our own inner nature, to adjust to society and become part of the social scene, and to speculate on our place in the universal scheme of things. And like the peoples of the past, we still try to express these continually recurring themes in our poetry, music, art, and literature.

If human nature is a constant, human invention is a bedazzling variable. In the past few decades, we have seen the arrival of jet transportation, the development of atomic energy, the computerization of information, and the beginning of satellite communications and space exploration. It is doubtful, however, that the thrill of supersonic air speed is any greater that when the ancients first rode on horseback, when the Industrial Revolution produced the iron horse, when gunpowder was first invented, or when new continents were first explored in the age of discovery. Electronics and photojournalism have brought the whole world before our eyes. We can now watch astronauts walking on the surface of the moon and computer-controlled shovels scooping up soil samples on Mars. Yet people have always communicated--another constant--and the development of speech, language, writing, and the printed word are equal causes for wonderment. The ever-shrinking horizons have reduced our world to a planetary community. The process has also contracted our sense of time so that knowledge about the arts of the past has molded the present into an extended historical now.[2]

QUESTIONS FOR READING SELECTION NO. 2

I. MAIN IDEAS. - Choose the best answer.

____14. The central theme of this selection is

a. Human nature is a constant and human intervention is a variable.
b. Artists are concerned with both constants and variables.
c. We express the same themes in art that the ancient Greeks used.
d. People have always communicated in some manner.

____15. The conclusion of the second paragraph is

a. Modern inventions have made the world seem smaller and the past seem closer.
b. Human nature is a constant and human invention is a variable.
c. Jet transportation, atomic energy, computerized information, satellite communications, and space exploration are modern inventions.
d. The development of speech, language, writing, and the printed word were just as important as modern inventions.

II. SUPPORTING DETAILS Classify the following details. Write "C" for each constant and "V" for each variable.

____16. Communication between people.

____17. The miracle of birth.

____18. The development of atomic energy.

____19. Coming to terms with our own inner nature.

____20. Astronauts walking on the surface of the moon.

____21. The change of the seasons.

III. CRITICAL READING - Choose the best answer.

____22. The thrill of supersonic air speed is compared to

a. the development of speech, language, writing and the printed word.
b. the first explorations of new continents.
c. computer-controlled shovels scooping up soil on Mars.
d. astronauts walking of the surface of the moon.

____23. The author's purpose is to

a. demonstate how times have changed since the days of the ancient Greeks.
b. give examples of the constants and variables that concern artists.
c. show the importance of modern inventions to art.
d. explain how art is influenced by constants and variables.

IV. VOCABULARY
Choose the best answer.

____24. The meaning of photojournalism in the second paragraph is

a. the use of copy machines to publish newspapers.
b. the use of computers to transmit news.
c. the reporting of news with pictures.
d. the use of pictures taken from satellites.

____25. The meaning of contracted in the second paragraph is

a. made agreement.
b. made larger.
c. made longer.
e. made smaller.

READING SELECTION NO. 3 - Social Science

THE SYSTEM OF ROYAL ABSOLUTISM

Aspiration of absolutism. In the period from 1650 to 1775 the royal architects of the national state system reached the height of their power. During this age of absolutism the king was in theory an autocrat responsible to God alone. The outstanding example of the absolute monarch was Louis XIV of France, who is said to have once exclaimed to his fawning courtiers, "L'etate, c'est moi" ("I am the state").

Under the system of absolutism the king aspired--although aspirations were often far different than realities--to exercise a tight control over his subjects. He was the supreme and only lawgiver. As head of the church he decided what religion his subjects were to follow and persecuted those who dissented. The worship of God was a matter of state, not of individual conscience. In accordance with mercantilist practice, the king sought to regulate every phase of economic life, from the establishment of new industries to working conditions and standards of quality. In addition, he was the arbiter of manners and fashion, the patron of arts and letters, and the personification of national glory. His will was enforced by an obedient and extensive bureaucracy--although far from the kind of administrative machinery that states today have at their disposal.

The aspirations of absolute monarchs were widely supported, for a powerful king stood for order, efficiency, security, and prosperity--values willingly exchanged for the uncertainties of upheaval and bloodshed such as had been experienced during the turmoil of the preceding era of religious wars.[3]

QUESTIONS FOR READING SELECTION NO.3

I. MAIN IDEAS - Choose the best answer.

____26. The central theme of this passage is

a. From 1650 to 1775 the royal architects of the national state system reached the height of their power.
b. The age of absolutism lasted from 1650 until 1775 when mercantilism replaced it.
c. Under the system of absolutism the king was obedient to an extensive bureaucracy.
d. From 1650 to 1775 kings aspired to be absolute monarchs who exercised tight control over their subjects.

____27. The main idea of the third paragraph is

a. There had been a great deal of turmoil in the preceding era of religious wars.
b. People supported strong kings because they wanted order, efficiency, security, and prosperity.
c. Absolute monarchs were supported because they stood for upheaval and bloodshed.
d. People were willing to change their values during the era of religious wars.

____28. When Louis XIV said, "I am the state," he meant that

a. he alone ruled France.
b. he was an outstanding example of a French person.
c. he owned all of France.
d. he and the courtiers could hunt anywhere in the state.

II. SUPPORTING DETAILS Write "T" if the following powers and roles were assumed by an absolute monarch, "F" if they were not, or "ND" if they were not discussed.

____29. He was the head of the church and decided what religion his subjects would follow.

____30. He was the patron of arts and letters.

____31. He was the head of scientific research.

____32. He was the supreme and only lawgiver.

____33. He was the commander of the army and navy, and conducted foreign policy.

____34. He regulated the working conditions and standards of quality in industry.

III. DRAWING CONCLUSIONS - Choose the best answer.

____35. We may infer from this selection that people of this period

a. were happy under the rule of absolute monarchs.
b. were willing to give up a great deal of freedom to have peace and prosperity.
c. were allowed a great deal of religious freedom.
d. had to pay high taxes to support the absolute monarchs.

____36. One reason for the rise of absolute monarchs was

a. People did not know which religion was best for them.
b. An extensive bureaucracy was set up to enforce their laws.
c. The outstanding example set by Louis XIV of France.
d. People had suffured in an era of religious wars before 1650.

IV. VOCABULARY - Choose the best answer.

____37. In the second paragraph, dissented means

a. agreed. b. disagreed. c. went away. d. stayed.

____38. In the first paragraph, an autocrat is

a. a person who collects cars.
b. a royal architect.
c. a person who rules alone.
d. a ruler elected without opposition.

READING SELECTION NO. 4 - Biology

THE BIOLOGICALLY IMPORTANT ELEMENTS

Of the 92 naturally occurring elements, only six make up some 99% of all living tissue (See Table 1-4). These six elements are carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur, cenveniently remembered as CHNOPS. These are not the most abundant of the elements of the earth's surface. Why, as life assembled and evolved from stardust, were these of such importance? One clue is that the atoms of all of these elements need to gain electrons to complete their outer energy levels. Thus they generally form covalent bonds. Because these atoms are small, the shared electrons in the bonds are held closely to the nuclei, producing very stable molecules. Moreover, with the exception of hydrogen, atoms of these elements can all form bonds with two or more atoms, giving rise to the complex molecules necessary for life.[4]

Table 1-4 Atomic composition of three representative organisms

Element	Human	Alfalfa	Bacterium
Carbon	19.37%	11.34%	12.14%
Hydrogen	9.31	8.72	9.94
Nitrogen	5.14	0.83	3.04
Oxygen	62.81	77.90	73.68
Phosphorus	0.63	.0.71	0.60
Sulfur	0.64	0.10	0.32
CHNOPS total:	97.90%	99.60%	99.72%

QUESTIONS FOR READING SELECTION NO. 4

I. MAIN IDEA - Choose the best answer.

____39. The main idea of this paragraph is

a. The six elements of life can all form bonds with two or more atoms.
b. CHNOPS stands for carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur.
c. Six elements make up 99% of all living tissue.
d. There are 92 naturally occurring elements.

II. SUPPORTING DETAILS
The following statements are given as reasons for the six elements being important to life. Use the reading selection to decide whether they are true (T), false (F) or not discussed (ND).

____40. The six elements form covalent bonds.

____41. All but hydrogen can bond with two or more atoms.

____42. Other elements are more abundant on the earth's surface.

____43. A carbon atom has four electrons in its outer energy level.

____44. The six elements form very stable molecules.

III. CRITICAL READING Use the Table 1-4 to help you complete the following statements.

____45. The _____body is composed of the same elements that make up alfalfa and bacterium.

____46. The organism with the highest percentage of oxygen is _____.

____47. The organism with the highest percentage of carbon is _____.

____48. The element that makes up the smallest percentage of alfalfa and bacterium is _____.

____49. The element with the most similar percentages in all three organisms is_____.

IV. CRITICAL READING: Drawing Conclusions. Choose the best answer.

____50. Hydrogen atoms can bond with

a. only one atom of other elements.
b. two or more atoms of other elements.
c. the nuclei of other elements.
d. complex molecules of other elements.

____51. The author believes that

a. life was created.
b. life evolved from other matter.
c. life depends on complex, unstable molecules.
d. life is an abundant element of the earth's surface.

VOCABULARY - Use the reading selection to choose the definition that best fits each word.

____52. tissue

a. soft flesh
b. shared electrons
c. cell structure
d. human beings

____53. nuclei

a. nerves
b. cells
c. edges
d. centers

____54. bonds

a. investments
b. secure connections
c. elements
d. extra orbits

____55. composition

a. make-up
b. written work
c. agreement
d. artistic form

____56. organism

a. element
b. physical response
c. operation
d. living thing

Notes

[1]From Harbrace College Handbook (9th ed.) (pp. 54-55) by J. C. Hodges and M. E. Whitten, 1982, New York: Harcourt Brace Jovanovich, Inc. Copyright 1982, 1977, 1972, 1967, 1962, 1956, 1951, 1946, 1941 by Harcourt Brace Jovanovich, Inc. Reprinted by permission.

[2]From Arts & Ideas (6th ed.) (p. 4) by W. Fleming, 1980, New York: Holt, Rhinehart and Winston. Copyright 1980, 1974, 1963, 1955 by Holt, Rhinehart and Winston. Reprinted by permission.

[3]From Civilization Past and Present (5th ed.) (p. 442) by N. M. Bailkey, G. F. Jewsbury, A. M. Taylor, and T. W. Wallbank, 1978, Glenview, ILL.: Scott, Foresman and Company. Copyright 1978, 1975, 1971, 1967, 1962 by Scott Foresman and Company. Reprinted by permission.

[4]From Invitation to Biology (3rd ed.) (p. 23) by N. S. Barnes and H. Curtis, 1981, New York: Worth Publishers. Copyright 1981, 1977, 1972 by Worth Publishers, Inc. Reprinted by permission.

BIOGRAPHICAL SKETCH

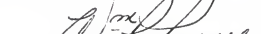
Shirley McLeod Beville was born July 7, 1934, in Bartow, Florida. She received her Bachelor of Arts degree in elementary education from the University of Central Florida in June 1970.

She taught in the public school systems of Washington and Lake counties and received a leave of absence to obtain her Master of Education degree in reading from the University of Florida in June 1976. She continued her graduate studies at the University of Florida and received her Specialist in Education degree in August 1977.

For two years she was a reading instructor at Santa Fe Community College. After directing the Special Services Program there for another year, she returned to the University of Florida to complete the requirements for the Doctor of Philosophy degree in curriculum and instruction.

Mrs. Beville is currently an instructor in the high school vocational education program at Santa Fe Community College and resides in Gainesville with her husband, Jim, and her mother, Ruth McLeod.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



William R. Powell, Chairman
Professor of Instruction and Curriculum

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Robert S. Soar
Professor of Foundations of Education

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Professor of Educational Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May 1986

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